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Collaboration in Purchasing

ATTENTION has been focused upon the functions of the buying organisation, which is an essential department in most concerns, by the recent meeting of the Purchasing Officers' Association, and in particular by the paper read at that meeting by Mr. R. H. White upon the subject of "Group Purchasing." At the outset, Mr. White rightly restricts the desirability of group purchasing to groups of associated companies, in which term he includes companies having the same management, or whose shares are held by a holding company, or whose capital is controlled by one Board of Directors. He seems disposed also to include companies known to be closely associated. It would seem, however, that a restriction should also be made in the sense that the associated companies should require to purchase much the same class of goods. With the best will in the world we cannot see that those requiring dissimilar articles can profit by group purchasing.

Group purchasing may be organised in two ways. In its most complete form there would be a single central purchasing office into which all requisitions would be sent, and which would then make the purchase. This method has fundamental objections, not mentioned by Mr. White, in that the purchasing officer for a large group will not have that complete technical knowledge of the purpose for which the goods are required and of exactly what the purchaser needs. The result is that he is often unable to discuss the matter intelligently with the supplier, and when difficulties arise he must pass the tenders over to the engineer at the purchasing works for whom he is acting. The usual result is that the supplier cannot get a direct interview with the man who wants to use the goods, and a contact, valuable to both sides, is missing. Those who have to deal with certain Government departments are well aware of this difficulty. "This matter has been passed to our technical people," is the usual reply received by enquirers in many of these offices.

Alternatively, if the matter is not passed over for the comments of the direct user, the result is often the purchase of more or less unsuitable goods. In support of this method, Mr. White pleads that the usual buying department for a small firm consists of three or four individuals, containing no experts, whereas grouping would require fewer people, and would allow certain allocation of duties leading to expert knowledge of prices, and so forth, and thus to greater efficiency.

The second method, which frankly appears better, is that there should be a Controller of Purchases in a central office, who would receive copies of all specifications and requisitions and orders from each of the buyers at the associated companies or works. These specifications and the prices at which the goods are bought would then be examined with an expert eye by the Controller and his staff. Whenever several concerns buy the same goods to different specifications or at different prices the Controller would call the buyers together to endeavour to fix a single type of material or plant for all works and consequently to smooth out the higher prices which might be paid unnecessarily. When thought desirable he would also make standard contracts with particular suppliers, the local buyers would then buy against this standard contract and would be saved a good deal of work. In this way, the Controller would safeguard the concerns from paying unnecessarily high prices, and aim at getting the best type of goods. The exercise of a "benevolent despotism" upon these lines seems to have much to recommend it.

One of the objects of group purchasing is to get better prices partly by quantity rebates, partly by avoidance of unnecessary expenses, and partly because manufacturers will grant better terms to large purchasers than to small ones. It is obvious that care must be taken not to carry the process of squeezing the supplier too far, or the answer must inevitably be to set up group selling organisations which would prevent one manufacturer from being played off against another. Subject to this safeguard, there is no doubt that group purchasing applied to concerns that are really in the same or very similar lines of business can be highly useful.

Its sphere of usefulness has been described above, but stress should be laid upon the value of laying down standard specifications within the concerns affected wherever standards are possible. Manufacturers can supply far more cheaply when they have not to work to many different qualities or patterns. Standardisation is being effected rapidly by the British Standards Institution, but frequently outside the work of that body money can be saved by the use of a common pattern, within the concerns forming a group. For foreign markets standardisation is especially desirable.

> *. . . It is a matter of surprise to me that the logical progression from central purchasing to group purchasing, or group control, has not been more widely applied in this country.*
>
> —*R. H. White.*

NOTES AND COMMENTS

Foreign Markets for Medicinal Products

A STUDY of foreign markets for medicinal, pharmaceutical and biological products covering 97 countries and trading areas, has been made by the Chemical Division, U.S. Department of Commerce. The study deals at considerable length with the market for such American products abroad, detailing the extent of the demand, competition, local production, methods of distribution, branch factories, local packaging of imported products, advertising regulations, local preferences, etc. Ten years ago, when a similar study was made, the United States was the world's largest exporter of medicinal products and accounted for 20 per cent. of the world's total import demand. To-day the study shows that the States are exporting approximately the same amount of medicinals as 10 years ago, but their position has fallen to fourth place, following closely behind the United Kingdom and France. Germany is well out in front, with its exports almost double those of its nearest competitor. An important point brought out in the study is the changed character of the trade. A decade ago practically all of the medicinals and pharmaceuticals entering into export trade channels were packaged and ready for the ultimate consumer. To-day, however, many of these products are exported in bulk or concentrated form and are elaborated and packaged in the country of destination. Medicinal chemicals, for example, are elaborated and pressed into tablets and pills, and liquid products arriving in the country of destination in concentrated form are diluted with syrup, alcohol, or other bulky ingredients before being packaged.

Coal Oil and Power Alcohol Production Costs

DATA supplied to the Australian Minister for Supply and Development by the Commonwealth Standing Committee on Liquid Fuels, on the cost of producing oil and power alcohol from coal, grain, grapes, etc., make interesting comparisons with the cost of the imported products. The Committee reports, according to the *Industrial Australian and Mining Standard*, that no technical advance in the production of oil from coal has been made since Sir David Rivett and the Hydrogenation Committee reported, respectively, in 1936 and 1937. It was then shown that the cost of a plant capable of producing only 45 million gallons of petrol a year from brown or black coals by hydrogenation would be between £11 million and £12 million, and the cost of production 17.3d. to 18.12d. per gallon on the basis of a return of 6 per cent. on capital, and 13.8d. to 14.4d. on the basis of 3.5 per cent. return. For the same capital expenditure 300 million gallons of petrol could be stored overground—a year's supply. The estimated cost of such storage, allowing for all capital charges and the purchase of petrol, is 8d. per gallon. Moreover, distributed storage would be less vulnerable than a concentrated extraction plant. Low temperature carbonisation processes are regarded by the committee as unattractive because of the lower per ton production of petrol and the difficulty of marketing by-products.

Petrol from Victorian Lignite

BASED on figures submitted by a German organisation, it is estimated that the cost of extraction from Victorian lignite would be 13d. per gallon of petrol. With plant expenditure on an Australian price basis that estimate would be increased. In any case, the price is three times that of imported petrol. If this industry produced 18 million gallons a year and employed 600 men (the estimate) it would mean a cost of £750,000 a year or £1,250 per man. With regard to the production of power alcohol from grain and grapes, the committee has expressed the opinion that the most economical source of power alcohol among products of the rural industries is molasses, but even from this material the cost of spirit produced would be four times the cost of imported petrol. Taking the value of power alcohol at 12d. per gallon the price that could be paid by the distillery for wheat would be approximately 12d. per bushel, and for barley and maize something less, after due allowance in each case for the value of by-products. At 12d. per gallon the distillery could not afford to pay anything for fresh and dried grapes in the volume in which they would probably be available. In the light of this information, the Government did not regard grains and grapes as an attractive source of power alcohol.

Industrial Alcohol and Derived Products

A REVIEW of the Distillers Company's activities during the past year given by the chairman, Lord Forteviot, at the company's annual meeting, contained an account of the business position in industrial alcohol and derived products. Lord Forteviot said that the industrial alcohol market during the last year had not varied very much, and the quantity sold by the company was approximately the same as the year before. Owing to the imposition of a tax on industrial alcohol for motor fuel, the quantity sold had decreased, but not to a very large extent, and it was made up for by other uses. On the chemical side of the business the company had been actively extending their interest in the manufacture of new products. They were neglecting no opportunity of investigating all possible methods for the manufacture of industrial alcohols and chemicals from such indigenous materials as coal or coke or waste industrial gases, should, at any future time, such methods become cheaper than those in use to-day. At present their basic raw material, as is well known, was molasses, which had to be imported in very large quantities.

Great Britain's Loss of Export Trade

AT the Institute of Export meeting held on Tuesday, Mr. E. F. L. Brech, Research Officer to the Education and Training Committee of the British Management Council, had some important things to say about education and training for the export trade. The following is a summary of his remarks. No one would be prepared to dispute the importance of export trade to Great Britain, even though at present there are many who are rather short-sighted in their outlook and are ready to let armaments activities overcloud that importance. But unfortunately it is very difficult to dispel the influence of the nineteenth century in regard to export trade. One so commonly meets the view that Great Britain is supreme in export trade and has nothing to worry about; these people do not admit, or do not know, that for some fifty years now Britain has been losing her grip on world markets. The Great War did a lot to hasten the tendencies, and as a result of it we lost a very large part of our export trade in a short space of time; but we would have lost it just the same in a longer time, given the continuance of our attitude towards export trade. And that attitude *does* still remain a given fact. We are amateurs at export trade; granted, there are many firms that give splendid attention to their markets, but speaking generally one can say that industry

in Great Britain does not take its export work seriously enough. For expert evidence one has but to refer to the reports of two official inquiries: the various documents of the Balfour Committee on Industry and Trade, 1925/29, and the Goodenough Committee on Education for Salesmanship, 1930/31. A study of export trade figures in the past twenty years is equally instructive.

Importance of Training for Export Trade

BUT in no way do we show our amateur attitude towards export trade more than in our method of education and training for export trade, or perhaps one had better say in our lack of method in education and training for export trade. The Appointments Officer of the University of Birmingham recently said that he cannot remember a single case of a graduate entering export trade in Birmingham in recent years. Nor does one find the firms giving their export men any special training or encouraging them to take special courses in their spare time. How many British representatives abroad, especially in overseas markets, have a thorough knowledge of the territory and population they service, in addition to the language? Where in Great Britain is there the counterpart of the Aussenhandelsschule in Hamburg—a special school of advanced character devoted to training for export trade? The course of studies serves to train these young men in languages, but more so in the knowledge of the countries they are to serve, their popular habits, peculiarities of taste, and so on. Great Britain needs more than all else to begin *now* to think about education and training for export trade—when armaments boom (or the next war!) is over, we shall need every possible skill to hold our own in the fiercely competitive world of export trade.

The Excise Duty on Continuous Filament Rayon

MR. J. H. MANDELBERG at the general meeting of Harben's (Viscose Silk Manufacturers), Ltd., referred to the failure of a renewed request to the Chancellor of the Exchequer for the removal of the Excise duty of 6d. per pound on continuous filament rayon yarn. He said that the attitude of the Government in retaining this duty was difficult to understand. It was admitted that the duty was unsound and unfair, it was a tax upon a raw material, it discriminated against continuous filament rayon yarn as there was no such duty upon cotton and wool, and the Excise duty which was at one time imposed upon rayon staple fibre had quite rightly been removed. Rayon staple fibre did, however, compete directly with continuous filament rayon yarn, he continued, so that the removal of this duty had imposed an additional handicap on the sale of the company's product. Owing to repeated decreases in the selling price of viscose rayon, the duty had a much higher *ad valorem* effect than was intended when it was imposed, and it was a serious handicap to an industry which had lately not been a prosperous one. The contrast between what was in effect, although not in intention, penal taxation on rayon production in Great Britain, and the Governmental encouragement and help given to it in other countries was very striking. He did not believe the Government had seriously taken into consideration the fact that the removal of this duty would give an immediate impetus to the rayon industry, and so produce considerable revenue through taxation of profits and through decrease in unemployment. Speaking of other conditions in the rayon industry, Mr. Mandleberg said that the co-operation now existing in the industry had continued to work well, and had grown in extent. As one result of this, selling prices had reached a reasonable level.

South African Chemical Notes

(From a Special Correspondent)

IN the revised Customs tariff recently passed in the House of Assembly there is a schedule in which increases in duty are recommended by the Board of Trade and Industries. The items listed include unrefined castor oil, colour washes, and distempers in paste or powder form.

New Cellulose Lacquer Industry

The cellulose lacquer industry has been established in South Africa on a firm basis with heavy commitments in plant. Apart from an effort made some six years ago, which was abandoned, and certain smaller concerns that were started on the Rand by European refugees, the large factory that has been opened in Durban is the start of the industry in the Union. It will manufacture Shervin-Williams automobile finishes, Opex lacquers and Kem synthetics.

Nitro-Cotton from Wattle Bark

Nitro-cotton has been made in Natal from pure cellulose extracted from waste wattle bark and banana stems, and its use as an explosive has been demonstrated at a brick and tile quarry. The product may assist to make South Africa more independent of imports; in any event, even if the cellulose does not meet requirements for the manufacture of explosives, it will be satisfactory for making artificial silk and other products requiring cellulose as a base.

Acetylene for Ripening Fruit

Acetylene is now being used to ripen fruit in South Africa, and peaches, oranges and other fruits are being brought to maturity in a short space of time; for example, tomatoes have been made to ripen completely 10 days before the normal time. The Senior Fruit Inspector of the Union Government is largely responsible for the experiments. Working with the Kelsey plum, which was thus placed in an atmosphere containing acetylene, fruit which had been completely green ripened after the lapse of only five days. Not only did the treated fruit begin to show the healthy red tint after 24 hours, but was found to become particularly sweet. Similar work has been in progress at the Fruit Experimental Station at Nelspruit by the Department of Agriculture. Here work was concentrated on citrus. It was found that 1 per cent. acetylene at 21° C. brought about ripening.

TEST CODE FOR FUEL FIRED FURNACES

A British Standard Code (No. 859) has been issued dealing with the testing of continuous and intermittent furnaces with or without recuperators or regenerators, for heating and heat treatment purposes. It provides for two forms of test, viz.:—

Part 1. A short, simple code for carrying out, at minimum cost, simplified industrial tests for evaluating the performance of furnaces as effective and economic units.

Part 2. A comprehensive code for the complete evaluation of the performance and the efficiency of furnaces.

The code is applicable to mill and forge furnaces for the continuous and batch heating of ingots, slabs, blooms and billets and to a wide range of fixed hearth, bogie and conveyor type furnaces employed by the iron and steel industry for the reheating and heat treatment of rolled, forged or cast products. It is also applicable to certain furnaces used in the non-ferrous and other industries.

The committee responsible for drafting this test code have endeavoured to make it as comprehensive as possible in regard to its application and, although various specific types of furnaces are provided for, it must be realised that other types exist and still more will be evolved in the future.

Copies of this new British Standard (No. 859-1939) may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. each (2s. 2d. post free).

MATERIALS OF CONSTRUCTION

An Evaluation of Some of the Corrosion-Resistant Products

A REVIEW of the salient corrosion-resistant features of chemical stoneware, glass-lined equipment, synthetic rubber and natural rubber linings, and certain of the metals and alloys is given by Mr. J. M. W. Chamberlain in *Chemical Industries*, July, 1939, *45*, 41-45.

Possible materials for the construction of corrosion-resistant vessels are divided into two groups. The division point, in terms of size, is approximately 500 gallons. Below this capacity, equipment may be fabricated from practically all the corrosion-resistant materials, except glass, which is not obtainable in one-piece construction for capacities much in excess of 40 gallons. In the capacity range up to 500 gallons; price, mechanical suitability, and personal preference play a strong part in selecting the material to be used. Above 500 gallons it is generally necessary to find a design that is capable of fabrication to meet both physical and corrosion-resistant requirements. In very large equipment, initial price frequently has to be the last consideration.

Choice of Material

In small equipment, if one considers only corrosion-resistance, the choice of material is comparatively easy. For acid services, chemical glassware is without equal, but cost, mechanical strength, and ability to fabricate to unusual sizes and shapes frequently suggest the substitution of chemical stoneware. For vessels holding 25 gallons or more, stoneware, which has corrosion-resistance practically equal to high grade glass, offers superior strength at much lower cost. Both glass and stoneware lack the ruggedness of steel equipment. Chemical stoneware, however, suffers the same fabrication restrictions as glass, when sizes much exceed 500 gallons. Glass enamel lined equipment, while not quite possessing the corrosion-resistance of chemical glassware, is capable of extending the general advantages of both glass and stoneware to vessels of several thousand gallons capacity. Rubber, synthetic rubber, and synthetic resin-lined equipment further extend vessel capacities to any size required. The corrosion-resistance of these last three lining materials is not as broad in scope as chemical stoneware or glass-lined equipment, but an increase in ruggedness and flexibility of design frequently suggest their use.

Many metal alloys and some metals are available that have excellent resistance to attack from certain groups of corrosive agents, but they must be very carefully selected for the job at hand. An alloy can seldom be specified unless it has been tested for the exact commercial solution to be handled, as extremely small percentages of foreign materials may cause rapid deterioration.

Chemical Stoneware

Chemical stoneware was the first material used to handle commercial quantities of corrosive substances in the chemical industry. It is a strong ceramic material, the physical properties of which can be varied over a wide range by modifying the body composition. Its resistance to attack by corrosive materials is only equalled by high grade chemical glassware. Hydrofluoric acid or its compounds attack stoneware, as do hot concentrated alkalies. The material is relatively inexpensive, even when fabricated in special shapes. One-piece vessels holding more than 500 gallons can be fabricated, but are not considered practical in service.

Chemical stoneware, while having a high compression strength, is rather easily cracked by impact shocks or sudden, violent temperature changes. Proper design and use minimise the danger of mechanical breakage, and some of the new high conductivity bodies minimise the danger of thermal failure. Many standard sizes and shapes are available in containers ranging from one to 500 gallon capacity.

While some chemical stoneware bodies are non-absorbent, an unglazed surface is hard to clean. Chemical stoneware can be given a surface glaze which facilitates cleaning.

Chemical stoneware tanks should be heated and cooled slowly, and must not be heated by direct exposure to an open flame. Heating is accomplished by liquid jacketing or internal coils.

Due to the nature of the material and the very high temperatures to which it is fired, there is some tendency toward warpage and dimensional inaccuracy. Tolerances of plus or minus 2 per cent. are an acceptable commercial standard. Exact dimensions may be obtained by machine grinding of the fired product.

Complete accessory equipment is available for use with stoneware vessels. Such accessories include pipe, valves, pumps, fans, and so forth.

The physical properties of stoneware can be made to vary over very wide ranges and the manufacturers should be given complete details regarding the use to which the stoneware article will be put. This information should include temperature variations, materials to be handled, and physical loadings.

Glass-lined equipment is fabricated by using special grades of fritted glass which are sprayed on to the surfaces to be covered. After spray coating, the articles are placed in an enamel furnace and the frit fused into a continuous mass, well bonded to the steel which it covers. The process of glass lining is, in reality, a refined porcelain enamelling. The enamel frits used for glass linings are compounded to have the maximum possible corrosion resistance and an elastic behaviour which will permit the glass coverings to follow the expansion and contraction of the metal on which it is placed.

Properties of Glass-Lined Equipment

Glass-lined equipment is easily kept clean, for its surface is non-porous and smooth. Open and closed vessels, process equipment, and storage tanks can be glass-lined. Glass-lined pipe is also available for use with this equipment. The size of vessels which can be lined with glass is limited by the capacity of the enamelling furnaces. Glass-lined equipment extends the general advantages of regular laboratory glassware to vessels of 5,000 gallons capacity. A successful glass lining requires special design of the metal structures to be covered. Metal parts must be heavy enough that they do not warp in the enamelling furnace. Expansion and contraction behaviour of all the component parts to be covered, must be fairly uniform to prevent cracking of the glass lining. Glass-lined equipment can be subjected to reasonable thermal shocks in the range of zero to 650° F.

In heating or cooling glass-lined equipment, it is important that the heat transfer be as uniform as possible over the entire glass-lined surface, and this is most readily accomplished by jacketing the equipment. Open flames should never be directly applied. The heating medium should be under quick and positive control. With properly jacketed equipment, temperatures up to 600° F. are readily attainable.

Glass-lined equipment does not contain lead, tin, or oxides of arsenic, and is, therefore, non-poisonous, and may be used to handle many pharmaceutical and food products. Glass-lined equipment resists nitric, sulphuric, hydrochloric, cold phosphoric, hydriodic, aqua regia, inorganic acids, and their mixtures. Solvents and hydrocarbons do not affect glass-lined equipment, and it resists the action of the metallic chlorides. Glass coverings are attacked by hydrofluoric acid and salts of this acid. It is also attacked by hot caustics or hot con-

centrated phosphoric acid. It is slightly attacked by hot milk of lime, cyanides, and salts of similar character.

Glass-lined equipment can be damaged by mechanical impact and linings once chipped off cannot be restored to their original form, unless the whole vessel is returned to the factory and re-enamelled.

Steel covered with a protective lining of either synthetic or natural rubber has become one of the most valuable types of construction for handling acids, alkalies, and other corrosive substances. Great design flexibility is possible in equipment of this type. There are no limitations on size. Coverings may be applied to vessels ranging in capacity from one pint to 100,000 gallons. All of the structural advantages of steel fabrication are at the disposal of engineers designing rubber-lined, corrosion-resistant vessels, pipe, and process equipment. Great strides have been made by improving rubber compounds to resist an ever increasing variety of corrosive substances. The methods of adhering rubber to steel have been improved to the point where adhesion difficulties are practically a problem of the past.

A limiting factor in all rubber-lined equipment is temperature. For use above 150° F., rubber linings, both natural and synthetic, are still in the experimental stage. Mechanical means have been devised to protect the linings at temperatures in the range of 150° F. to 225° F. From 225° F. down, a wide background of experience has been built up which proves the value of these linings for many services.

Rubber-lined steel equipment, to-day is frequently given first consideration when corrosion-resistant equipment is to be fabricated. The low relative cost of rubber-lined steel construction, combined with the inherent strength of the outer steel structure, plus the general chemical inertia displayed by rubber compounds, permits the solution of practically all corrosive problems at normal, or relatively low temperatures. The few substances which attack natural rubber linings can now be readily handled by a new adaptation of one of the so-called synthetics of rubber-like nature.

Until the introduction of satisfactory synthetic rubber-lined equipment, it was impossible to handle oxidising agents, such as concentrated sulphuric and nitric acid in this type of equipment. The remarkable strides made with synthetic linings now permit the lining of tanks which are almost universal in their resistance to corrosion. A grade of synthetic rubber lining is now available which is not affected by acids or alkalies (provided the temperature of the lining does not exceed 150° F.), except glacial acetic. This new grade of synthetic rubber also has remarkable resistance to solvents and hydrocarbons, in general being attacked only by the chlorinated solvents, gas distillate products, and creosote. As yet, the synthetic lining materials are not suitable for use with high concentrations of caustic. The availability of synthetic linings at prices competitive to natural rubber assure a tremendous field of application for this new material.

Types of Rubber Linings

Natural rubber linings fall in five classes: Unvulcanised pale crepe, soft vulcanised, hard vulcanised, a combination of soft and hard types, and latex linings.

The unvulcanised pale crepe type is now used to a very limited extent for corrosion-resistant linings in chemical storage work, process or transportation equipment, the bulk of rubber linings now applied being of the vulcanised type.

The soft vulcanised linings are better capable of following the expansion and contraction of the steel on which they are placed than the hard vulcanised grades. Soft vulcanised rubbers, however, do not possess the degree of inertness to either corrosive attack, or oil and grease absorption exhibited by hard rubber. For handling many substances, however, the soft rubber is perfectly satisfactory, and is not readily damaged by mechanical impacts.

The advantages of both the hard and soft rubber linings have been combined to form a triple rubber lining. These triple-effect linings consist of a soft layer bonded to the steel, a hard second layer, and a soft outer, or third layer. This construction permits the absorption of differential expansion and contraction by the soft rubber and the steel shell and at the same time, retains the maximum corrosion resistance exhibited by the hard rubber. This novel construction overcomes failures due to mechanical impacts or exposures to low temperatures. The triple-effect joints used with this type of construction take up the differential expansion and contraction of the centre hard rubber layers. This construction, combined with the Vulcalock process of adhesion have undoubtedly been dominating influences in making rubber linings commercially practical.

Latex Type Linings

Latex type linings which are applied by spraying, painting or dipping the steel to be covered in a solution of compounded rubber latex, can be advantageously used for some work. For certain types of articles having irregular contours, the latex method of applying rubber is more economical. Latex coverings, after vulcanisation, may fall in either the category of soft or hard vulcanised. Some synthetic rubber latex lining work has been done, but as yet, has not found extensive commercial application. Latex linings in general suffer several restrictions. Rubber deposited from latex dispersions, even after vulcanisation, is more susceptible to absorption of water, oil, or other liquids, than rubber which has been prepared in the form of calendered sheets subsequently applied. It is also impossible, with latex rubbers, to build up composite soft and hard rubber membranes of the triple-effect rubber type.

The new plasticised synthetic resin linings of the modified halide polymer type are now available at prices competitive with rubber linings, and possess, in a large degree, the mechanical advantage displayed by the best natural rubber linings, plus an even wider range of inertia to attack by corrosive substances. Equipment lined with synthetic rubber-like materials give great promise of replacing much of the tank and pipe equipment now used for handling corrosive materials.

Synthetic resin-lined equipment closely resembles glass-lined in many particulars. The same general mechanical construction is used in fabricating the articles to be lined. It is unnecessary to have heavy metal sections for resin linings, as they do not have to be heated to high temperatures during application. Synthetic coatings are applied to steel or other containers, either by spraying or brushing, and are hardened by evaporation of the solvent, chemical reaction, or vulcanisation, depending upon the type of resin compound used. Synthetic resin linings have a marked degree of flexibility and are not easily damaged by mechanical impact.

Equipment is also available made from synthetic resins reinforced with fillers of asbestos or cotton fibres. This type can be made in solid sections with only superficial external metal supports. Resin-lined metal equipment has practically no size limitations. The material may be applied in the field, and such heating processes as may be required can be carried out locally.

Dense, non-porous resin coatings are available that are easily cleaned. The simplicity of their application and their relatively low cost gives them a wide application in pharmaceutical, cosmetic, food and beverage storage fields. Resin-linings are not suitable for use at high temperatures. Some types cannot be used above 180° F., while some others at present available, may be used at temperatures up to 350° F.

In general, resin-lined equipment is resistant to milk, alkalies, water, and many acids other than those which are strongly oxidising. Most salt solutions can be handled, but all strong oxidants are liable to cause trouble. It should be borne in mind that not all resin-linings are resistant to the same types of corrosive materials.

Vessels, pipe, and process equipment of all types and sizes can be fabricated from the corrosion-resistant alloys and metals. Unlike the products described above, each of which

is capable of handling a relatively great variety of corrosive substances, the metals are limited in the scope of corrosive agents that any one metal resists satisfactorily. This fact, however, does not, in any way, prevent the metals from being one of the most important modern materials for the construction of corrosion-proof equipment. A wide variety of alloy steels, metallic elements and non-ferrous alloys are available and by proper selection, most of the corrosive substances in common use can be handled satisfactorily. Some of the alloys, such as chrome nickel steels which are finding widespread commercial application, are now available at reasonably low prices. The relatively high cost of some of the other alloys which are not used extensively, virtually prohibits their use for corrosion-resistant work, except in those cases where no other material will satisfactorily solve the problem. In addition to the alloy steels and non-porous alloys, there are a number of metallic elements which are frequently used for corrosion-resistant construction. These range from relatively cheap lead through aluminium and nickel to tantalum, a metal which, while very expensive, exhibits inertia to corrosive attack by a wide range of substances.

Each alloy or metal has its own list of agents which it will resist, and these lists are available from the various metal manufacturers. While an alloy or metal may satisfactorily resist a pure chemical, its resistance to corrosive attack by commercial qualities of the chemical may be entirely unsatisfactory due to the presence of small percentages of foreign substances. For this reason, it is always recommended that alloys be tested with the commercial materials that they will be required to handle and under similar conditions of agitation and aeration, both of which have a direct bearing on the metal's ability to resist attack.

Sulphamic Acid

Its Use in the Separation of the Rare Earths

THE following is an abstract of a thesis presented by J. Kleinberg for the Ph.D. degree of Illinois University, 1939.

The advent of sulphamic acid as an industrial chemical has opened new fields of research. Several reactions of sulphamate solutions suggested its possible use in separating the rare earths. Sulphamic acid hydrolyses to give ammonium acid sulphate. It was regarded as possible that rare earth sulphamates would hydrolyse to give the corresponding sulphates :—

$$2(RE)(SO_3NH_2)_3 + 6H_2O - H \rightarrow (RE)_2(SO_4)_3 + 3(NH_4)_2SO_4$$

Such a reaction would serve to build up the sulphamate ion concentration slowly. Theoretically it seemed possible that a separation might be effected in this manner.

Sulphamates undergo the following reaction when treated with alkali nitrite in acid solution :

$$SO_2NH_2 + NO_2 - H \rightarrow N_2 - SO_4 + H_2O.$$

An acid solution of rare earth sulphamates upon treatment with sodium nitrite would consequently contain all those ions necessary for the formation of the double alkali sulphates. It should, therefore, be possible to effect a separation of the rare earth elements into two groups by the above reaction, since the classical method for the separation of the rare earths into the lanthanum and yttrium groups involves the formation of the double alkali sulphates. Moreover, since the sulphate ions is formed in place, local action should be prevented.

Practical Tests.

Attempts to effect a separation within the lanthanum groups and between the lanthanum and yttrium groups by hydrolysis of solutions of rare earth sulphamates (formed by the action of sulphamic acid on the rare earth oxides) were unsuccessful. Spectrographic analysis of fractions removed, showed no separation.

Separation of cerium-free rare earth oxide mixtures into lanthanum and yttrium sub-groups was effectively accomplished by conversion to sulphamates and the subsequent treatment of an acidic solution of the sulphamates with sodium nitrite. Comparative separations were made by the classical double sulphate method. Determination of the mean atomic weights of the various fractions showed that the sulphamate method compares favourably with the classical manner of separation.

Since the rare earth sulphamates were used in solution, several representative ones were prepared and isolated. The method consisted of treating the oxide with aqueous sulphamic acid and dehydrating the resulting solution with ethyl alcohol until the rare earth sulphamates had been converted into solids. The sulphamates of lanthanum, neodymium, samarium and yttrium were prepared in this manner.

The Chemical Age Lawn Tennis Tournament

Third Round Results

THE matches in the third round of the ninth annual CHEMICAL AGE Lawn Tennis Tournament were completed on Monday, in spite of the bad weather during the last few weeks. The results are as follows :—

DOUBLES.—T. P. Williams and C. C. Gough (Lever Bros. and Unilever, Ltd.) beat M. B. King and R. F. Porter (Howards and Sons, Ltd.), 6—2, 6—2.

R. J. Sleap and A. Baxter (United Yeast Co., Ltd.) beat G. W. Hole (Anglo-Saxon Petroleum Co., Ltd.) and G. O. Ritchie (Shell-Mex and B.P., Ltd.), 6—2, 3—6, 6—2.

C. G. Copp and E. G. Floyd (Doulton and Co., Ltd.) beat J. J. Jenner and A. E. Munns (Imperial Chemical Industries, Ltd.), 6—4, 6—1.

I. R. Peake (R. W. Greeff and Co., Ltd.) and R. V. Hart (Hornsey Gas Co.) beat E. E. J. Went (British Drug Houses, Ltd.) and R. J. C. Derry (Gas Light and Coke Co.), 6—2, 6—4.

SINGLES.—A. W. A. Goudie (Corn Products Co., Ltd.) beat C. G. Copp (Doulton and Co., Ltd.), 5—7, 6—3, 6—3.

G. W. Hole (Anglo-Saxon Petroleum Co., Ltd.) beat H. Bowler (Nobles and Hoare, Ltd.), 6—2, 6—0.

E. G. Floyd (Doulton and Co., Ltd.) beat M. W. Seal (British Oxygen Co., Ltd.), 6—2, 8—6.

C. C. Gough (Lever Bros. and Unilever, Ltd.) beat R. F. Porter (Howards and Sons, Ltd.), 6—1, 6—3.

The winners in this round will now go on to the semi-final where the best of five sets is played. These matches should be played on neutral ground wherever possible, although in the event of disagreement a draw has been made for choice of ground and the competitors notified accordingly. The results of the semi-final must be sent to the Editor of THE CHEMICAL AGE immediately after the match, and must in any case reach him not later than first post on the day following the final day for playing off the round (August 21). As this is the holiday season it would be well for competitors to make arrangements for playing off their matches as soon as possible.

By the kind invitation of the Associated Portland Cement Manufacturers, Ltd., the finals of the Tournament will be held at the company's ground at Woodford Road, Snaresbrook, near Wanstead, on the afternoon of Saturday, September 16. Further details of the arrangements will be published at a later date.

THE Société des Produits Chimiques Pures is collaborating with the French Colonial Ministry in a plan for erecting wood-distillation plants in French West Africa (Ivory Coast). Preliminary tests on the Colonial woods carried out in France point to a considerably superior yield of distillation products in comparison with French wood. The wood charcoal accumulating from the treatment will be used as a motor fuel.

Letters to the Editor

Tile Construction for Acid-Resisting Tanks

SIR,—We read with interest on page 71 of last week's issue of THE CHEMICAL AGE a description of a special type of tile construction for acid-resisting tanks, showing a photograph of two tanks already constructed and a sketch of the special shapes, as supplied by Usine Ceramique de Beugin. We would point out that this type of construction is what is known as the Zeta type of construction which Beugin work under licence from Keramchemie-Berggarten, for which we ourselves hold the sole rights of supply in this country and the British Empire.

This type of construction has been much used on the Continent in the construction of chimneys, flues, acid tank linings and acid containers.—Yours faithfully,

A. H. WINDSOR.

H. Windsor and Co., Ltd.,
748 Fulham Road,
Fulham, S.W.6.
July 24.

Imperial and World Trade

From Brig.-Gen. Sir Henry Page Croft, Bt., C.M.G., M.P.

SIR,—The question of Imperial Preference recently came before the Federation of the Chambers of Commerce of the British Empire. There appears to be a great deal of misapprehension with regard to this subject for both Imperial Preference and the Ottawa Agreements are frequently attacked by Free Traders, and even in responsible newspapers criticisms appear, based clearly upon incomplete information.

An examination of the broad trend of trade in recent years is clearly necessary because one accusation frequently levelled against Imperial Preference and the Ottawa Agreements is that the policy was deliberately intended to injure foreign countries, a suggestion as absurd as the claim that from it has arisen the political tension that now exists. The historical sequence is ignored by the critics.

Prior to 1932, this country for generations had suffered from the ever mounting tariff walls of foreign countries. The year 1931 proved the impossibility of a continuance of the open market for foreign surplus products, and in 1932 we passed the Import Duties Act, without which our economic plight would have become intolerable. This measure made the widest application of Imperial Preference hitherto undertaken, for the duties we were forced to put upon foreign imports we did not extend to Imperial products.

The Ottawa Agreements Act followed at the beginning of 1933. From that time onward, the critics tell us, foreign trade has been severely restricted in favour of inter-Empire trade. The suggestion that Imperial Preference has induced the Colonies to favour United Kingdom goods to the exclussion of foreign, and that the Ottawa Agreements have done the same in the Dominions, is wholly untrue.

As to the Dominions and India, we find that between 1932 and 1937 their imports from the United Kingdom rose by some 46 per cent., but that in the same period their imports from foreign countries rose by no less than 76 per cent., a result which alone should silence the critics if they have any respect for truth.

In the same period, the imports into the Colonies from the United Kingdom rose by about 48 per cent.; from other British countries by about 50 per cent., and from foreign countries by about 49 per cent. There is no anti-foreign bias here.

If we go back to 1929, the year before the depression, we find that by 1937 the imports into the Dominions and India from neither the United Kingdom nor from foreign countries had struggled back to the 1929 level. From the U.K. they were still about 29 per cent. below, from foreign countries about 30 per cent. Imports into the Colonies in 1937 from the United Kingdom were about the same level as in 1929, but their imports from foreign countries had increased by some 18 per cent. Where is the exclusion of foreign trade?

The truth of the matter is that the Import Duties Act, the establishment of general Imperial Preference, and the Ottawa Agreements, gave to the United Kingdom, to the Empire and to the world at large, a confidence which at the time was badly needed. It resulted immediately in steadying the nerves of the whole commercial world with the effect that a general and regular increase in legitimate trade began to take the place of the distress selling which had been in evidence for two years. The abandonment or scaling down of these principles would shake the confidence of the component parts of the Empire with an inevitable reaction in all quarters of the globe.—Yours faithfully,

HENRY PAGE CROFT,
Chairman, Empire Industries Association.

9 Victoria Street, London, S.W.1.

Flames and Furnaces

International Conference to be held in London

AN International Conference on Flames and Furnaces will be held from September 17-20, 1940, at the Royal Institution in London. The Institute of Fuel has made itself responsible for convening the Conference, and the technical organisation has been undertaken by the British Coal Utilisation Research Association.

The progress in the scientific study of flame by the methods of chemical kinetics and spectroscopy is opening up new fields which have great engineering and industrial possibilities. One purpose of the Conference is to bring these new developments to the notice of engineers and industrialists with a view to accelerating their practical application. Modern industry is calling for higher performance from furnaces and this creates problems which can sometimes only be solved by fundamental research. The Technical Programme of the International Conference in 1940 has been prepared by a Committee of thirty engineers and scientists under the chairmanship of Mr. J. G. Bennett, the Director of the B.C.U.R.A., and constitutes a planned attack on the problem of flames and their industrial applications. Flames in the internal combustion engine and explosive flames generally are excluded from the scope of the conference, which will be concerned with the free combustion of gases, liquids and solids in air.

This field is, as a matter of fact, almost entirely unexplored; and the conference should, therefore, result in the collection and dissemination of hitherto uncorrelated information of much interest and practical value to the gas, oil and coal industries.

The Editorial Committee proposes to organise the conference on somewhat novel lines in that the authors of papers will be invited to collaborate in covering the whole ground of flame and furnace research with the minimum of duplication and overlap. Selected authors throughout the world will be asked to contribute papers on specified problems and early in 1940, the Editorial Committee will undertake the task of co-ordinating the various papers into a homogeneous review of the subject. Selected experts in each field will examine the papers, and act as chairman and reporters of the various technical sessions. The provisional technical programme of the conference has been published.

Mr. S. McEwen, Vice-President of the Institute of Fuel, who is Chairman of the Executive Committee to the Conference, hopes to secure a large attendance of foreign engineers and scientists for a conference which should be outstanding in its practical industrial significance.

THE Danish output of blood albumen has increased considerably of recent years, a ready market being found as an adhesive in the plywood industry. A principal source of supply is the pig industry, approximately 14 million kilograms of blood albumen being derived from the 4 to 5 million pigs slaughtered annually.

New Technical Books

THE SCIENTIFIC ASPECTS OF ARTISTS' AND DECORATORS' MATERIALS. By R. S. Morrell. London: Oxford University Press. Pp. 141. 5s.

It is now more than ever incumbent on an artist or a craftsman to know what he is using, if his work is to last for posterity to see, and it is in an endeavour to assist him in this respect that this book has been published. Chemicals and synthetic substances must of necessity be used in these days to create certain effects and results, and, by a strange irony, it is usually chemical action which may subsequently cause them to deteriorate. All these points are explained in this work which also describes what to avoid in the basic preparation and treatment of materials for various crafts.

CALCULATIONS OF QUANTITATIVE CHEMICAL ANALYSIS. Third Edition. By L. F. Hamilton and S. G. Simpson. London: McGraw-Hill Publishing Co., Ltd. Pp. 289. 15s.

In this edition, nearly all sections have been revised and several have been completely rewritten. An outline of the more common analytical determinations has been added. There has been a rearrangement of the problems and those with and without answers have been placed together following their appropriate sections. Many problems of a repetitious nature have been discarded, and about 150 new problems, many of which pertain to practical commercial analyses, have been added. The authors have attempted to give a greater number of problems which require careful reasoning on the part of the student and which are not solved by simple substitution in a formula.

MAY'S CHEMISTRY OF SYNTHETIC DRUGS. By P. May and G. M. Dyson. 4th edition. London: Longmans, Green and Co. Pp. 370. 21s.

This book has been almost entirely rewritten; the very great advances made since the previous edition have been greater on the practical than on the theoretical side and it is virtually impossible to predict the pharmaco-dynamic properties of a substance from a consideration of its chemical and physical properties.

In contradistinction to this the advances made on the practical side have been far-reaching and striking. Our knowledge of the structure of the majority of the hormones was then almost nothing. Now the structure of very many of them is known with a close degree of accuracy, some have been synthesised, and in the case of the oestrogenic hormones, artificial substances have been synthesised with an activity greatly exceeding that of the natural hormones themselves. In the case of the vitamins, the advance has been even more striking. At that date virtually nothing was known of their structure, and their synthesis seemed outside the bounds of possibility for many years to come. Now the structure of many of the vitamins is known, and several, such as A, B_1, B_2 and C, have been produced by truly synthetic methods. As an example of their increased importance, one section has been devoted to hormones and vitamins.

Very valuable practical advances have also been made in many other fields, as for example the various sulphonamide derivatives, the symmetrical ureas and the organo-metallic compounds. It has been thought desirable to mention briefly the therapeutic effect of most of the drugs, so that readers may gain some idea of their relative importance, but no attempt has been made to deal in any detail with pharmacology or therapeutics, subjects which lie quite outside the scope and aim of this book, although the volume may prove of interest to those medical men who desire to obtain unbiased information concerning the application of chemistry to therapeutics and pharmacology.

Amongst other changes which have been made in this edition mention may be made of the extension of the sections dealing with mercurials, with antimonials, antiseptics, local anæsthetics, analgesics and alkaloids.

Recent Trade Literature

The Technical Research Department of A. BOAKE ROBERTS AND CO., LTD., have published a booklet entitled "Novenates—their many industrial applications." These Novenates are finding increased application in industry as driers in oils, paints, varnishes, etc., largely due to the fact that they possess the salient points of a good drier; economy in use, high metal content, ease of solution, freedom from skinning, no decomposition on storage over long periods, etc. The booklet contains, among other things, short accounts of the properties of the individual Novenates and how they can be used for paints and varnishes, in printing ink and linoleum and for rot-proofing impregnation, etc.

HENRY WIGGIN AND CO., LTD., have recently published a 30-page booklet entitled "Monel—An Account of Its Properties, Principal Uses, Fabrication and Available Forms." As the title suggests the book is divided into four parts each dealing with one aspect of the alloy. Monel is particularly applicable to certain industries on account of its strength at high temperatures and its resistance to abrasion and corrosion. It can be supplied in various forms according to the purpose for which it is required; power plant, turbine blading, propeller shafts, in the chemical, textile and laundry industries, etc. Examples of its numerous fields of application are contained in the text of the book which is illustrated throughout.

THE VISCO ENGINEERING CO., LTD., have issued a leaflet No. 397 dealing with their Visco air filters, pressure type, for compressed air pipe lines. This contains pictures of the filter, some of the parts and an illustration of one in use. The "Visco" pressure type air filter is not only a trap for dirt and moisture, as the special filter cell causes oil and water vapour to condense and be retained. The filter has a cylindrical body with a bolted-on top cover and screwed or flanged air inlets and outlets. The lower portion forms the sump with a large size draincock for the removal of collected oil, moisture and dirt, and the centre contains the special filter cell. The leaflet describes the working of compressed air machines, the difficulties encountered, and how the "Visco" pressure type air filter helps to overcome these.

A booklet of Viscosity Conversion Tables has been published recently by the *Oil and Colour Trades Journal*. As there are several international standards of viscosity, buyers and users of oils are constantly in difficulties regarding the conversion of one viscosity into another. These tables, compiled by a well known oil expert, facilitate the method of conversion considerably. The first column in the table is kinematic viscosity in cs. and against this are viscosities in Redwood Seconds, Saybolt Seconds, and Engler Degrees. There is a section devoted to conversion factors and another to the classification of crankcase oils. In addition there are six examples of how the viscosity tables should be used. The cost of these tables is 3s.

The most recent bulletin issued by THE BRITISH THERMOSTAT CO., LTD., is No. 354A which deals with thermostats for controlling the temperature of air in the ducts of heating and air-conditioning installations, for controlling the temperature in rooms, cold chambers and drying ovens, and for use as immersion thermostats in vessels containing liquids. These thermostats operate on the vapour-pressure principle and are provided with phial and capillary tube. Two models are described, Type YM1 which has silver contacts and is housed in a bakelite case, and Type K5 which is a heavy-duty instrument with 15 ampere mercury-tube switch and die-cast metal case. In addition to full specifications of each model, the bulletin includes a section headed "Information Required when Ordering" which sets out twelve items upon which information is necessary to permit instruments correctly adjusted for a given purpose to be supplied. Another feature of the bulletin is the complete series of installation and service instructions included.

Malaya's Chemical Imports

The U.K. Maintains her Share

THE total imports of chemicals, drugs, dyes and colours into Malaya have increased, and the U.K. has maintained her percentage share of the trade at 35, according to a report on the economic and commercial conditions in Malaya, March, 1939, published for the Department of Overseas Trade by H.M. Stationery Office (2s. 2d.). The import figures are given in the following table:—

	1936. $ (000).	1937. $ (000).	1938. $ (000).
Total Imports	8,677	11,544	11,189
U.K.	3,075	3,965	3,889
Germany	1,023	1,323	1,280
Japan	962	1,034	181

Total imports of formic acid last year were 1,533 tons valued at $651,000, compared with 2,251 tons valued at $928,000 in 1937.

The U.K. provides the bulk of the insecticides used in Malaya, but her share has declined slightly during the past year and the imports from the U.S.A. and India, the two principal competitors, have increased. The author of the report draws the attention of manufacturers of insecticides to the Malayan Planting Manual entitled "An Outline of Malayan Agriculture" compiled by the Agricultural Economist in 1936. Chapters are devoted to all the major and secondary crops of Malaya, and sections of each chapter deal with the diseases and pests to which the different crops are subject and the method of eradicating them. The manual is published at $3 (approximately 7s.) and copies may be obtained from the Malayan Information Agency, Charing Cross, London, S.W.1.

In soda, caustic soda and sodium compounds, the U.K. supplies the bulk of the trade and has maintained her share of the market. The trade in caustic soda is likely to improve with the increase in the number of local factories manufacturing soap.

The U.K. has maintained her share of the trade in proprietary medicines at approximately one-third of the total trade. The main competition comes from Germany, U.S.A. and to a lesser extent, from Australia. There is also a large trade in Eastern remedies and specifics from China, Hong Kong, India and Japan. There is also a growing trade in locally manufactured medicines.

The aggregate imports of paints and colours have increased slightly during the past three years, and the U.K. share of the trade has remained constant at 60 per cent. China supplies the greater portion of the balance, and her imports are principally in paints, ground in oil or water. A paint factory, which is a branch establishment of a Dutch factory in the Netherlands Indies, was erected in Singapore in 1938, and it is anticipated that the factory will shortly begin production.

The Trade in Soap

Although there has been a decline in the total trade in household and washing soap in 1938, the U.K. percentage has risen from 60 to 70. Imports from Australia are increasing, but owing to the boycott there has been a reduction in the imports from Japan. There is an increasing local production. In spite of a reduction in the imports of toilet soap during the last three years, the imports from the U.K. have increased from 497,000 lb. (35 per cent.) to 542,000 lb. (45 per cent.). There is an increasing business in soap manufactured in the Netherlands Indies. Japanese trade has suffered from the effects of the boycott. As in the case of household and washing soaps, local production of toilet soap is growing.

The use of chemical fertilisers has increased considerably during the last eight years and, the report states, thanks to the very effective organisation in Malaya of the leading U.K. suppliers, the U.K. is obtaining the bulk of the trade. Particulars of the most suitable fertilisers for the different major and secondary crops grown in Malaya are given in "An Outline of Malayan Agriculture."

Economic Conditions in Sweden

Decrease in Value of Foreign Trade—Activities of Bolidens A/B

A REPORT on the economic and commercial conditions in Sweden published for the Department of Overseas Trade by H.M. Stationery Office (2s. 2d. post free) states that the steady improvement in economic conditions in Sweden, which dates back to the year 1934, culminated in a trade boom in 1937, and although the year 1938 was a difficult one for all connected with the country's business and industrial activities, foreign and internal trade was maintained at a remarkably high level. The domestic industries have attained a high degree of activity and a remarkable growth in the earnings of most classes of the people has been followed by a corresponding expansion of turnover.

The value of investments in industry planned or executed during 1938 exceeded the corresponding value for 1937 by about 7 per cent. Industrial output in December was about 7 per cent. lower than a year earlier, when it had reached the highest level ever recorded; for the whole year production fell by about 3 per cent. This reduction took place mainly in the export industries.

Chemical Imports and Exports

The value of foreign trade decreased by 5.3 per cent. and the year closed with an adverse trade balance of no less than 229 million knonor, which is the highest figure recorded since the year 1931. This position is in some measure due to the State's purchases abroad of raw materials, to a value of approximately 140 million kronor, to be stored for emergency purposes. Import trade has, of course, had the advantage of these extraordinary purchases and dropped by only 2.5 per cent., whereas exports dropped by 8 per cent. In general, however, the shrinkage in the value of foreign trade is due to a lower average of prices than in 1937. Chemical and pharmaceutical products; colours and varnishes; soap, candles, glues; explosives; fertilisers; imported into Sweden during 1938 totalled 165,781 thousand kronor as against 160,615 thousand kronor in 1937. Exports from Sweden of the same class of merchandise totalled 51,195 thousand kronor in 1938, compared with 54,015 thousand kronor in 1937.

Employment in the mining industry as a whole has been well maintained, the report states, in spite of the fact that some restriction of output is said to have taken place since November last year at the Lapland iron-ore mines, due to lower exports in recent months. This position is possibly temporary, as the latest returns show that the iron-ore exports of the Grängesberg Company during March, 1939, amounted to 925,000 tons, as against 892,000 tons in the corresponding month of 1938.

Bolidens A/B., the leading Swedish producers of gold and copper, experienced in 1938, according to their accounts, a favourable year. The firm continues to extend its enterprise and to utilise all available scientific methods and recent inventions for prospecting and other purposes. Important progress has been made, it is claimed, in utilising the sulphur and arsenic content of the ore. The amount of ore mined is being increased and the electrolytic copper works at Rönnskär extended.

The chief revenue of the company is still derived from gold, of which the production increased from 5,023 to 5,158 kilogs. The production of silver rose from 6,037 to 7,147 kilogs., but that of sulphur decreased from 18,432 to 17,793 tons; on the other hand, the output of roasted pyrites rose from 66,861 to 85,677 tons. The increase of four million kronor in gross profits is understood to have been obtained mainly from the production of gold, but considerable saving has been made by rationalising the operation of the mines. The writing off both on the mines and plant has been much increased, and it is estimated that the whole book value of the mine will be totally written off by the time when it is calculated that it will be exhausted. The dividend was maintained at 15 per cent.

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PERSONAL NOTES

MR. W. G. GIRLING has been appointed a director of General Refractories and the Glenboig Union Fire Clay Co.

* * * *

MR. H. G. WOOLMAN has been appointed manager of Reckitt and Coleman's new factory, which is in course of erection at Dunedin.

* * * *

MR. G. R. HILL has been appointed by the Privy Council as chairman of the Statutory Committee of the Pharmaceutical Society in succession to Sir Ernley Blackwell.

* * * *

MR. THOMAS WILKINSON, a director of the Distillers Co. has been appointed to the board of United Glass Bottle Manufacturers, Ltd., in succession to Mr. William Harrison.

* * * *

THE appointment of MR. DONALD CLARENCE GARRATT as public analyst for the Metropolitan Borough of Camberwell, has been approved by the Minister of Health. MR. MARTIN PRIEST, who formerly held the position, has retired.

* * * *

AT the recent meeting of the German Medical Science Association (Medizinisch-Naturwissenschaft. Ges.) in Jena the silver medal of the Association was presented to PROFESSOR DR. KIKUTH, of Elberfeld, for distinguished services in malaria control research. Professor Kikuth, who has also lately been appointed corresponding member of the Belgian Institute for Tropical Medicine in Antwerp, was the discoverer of the synthetic malaria specifics—atebrin and plasmoquine.

* * * *

MR. PETER F. BENNETT, president of the Federation of British Industries, and a director of Imperial Chemical Industries, Ltd.; LORD DUDLEY GORDON, chairman of J. and E. Hall, Ltd.; MR. A. C. MACDIARMID, chairman of Stewarts and Lloyds, Ltd.; and MR. J. ROGERS, a director of Imperial Chemical Industries, Ltd., are among those industrialists who have agreed to serve on an advisory industrial panel to assist in regard to the different branches of the work of the Ministry of Supply.

Mr. Peter F. Bennett.

Mr. A. C. Macdiarmid.

MR. WYBERT FIRTH, works manager, Consett Iron Co., has left estate valued at £9,403 (net personalty £8,930).

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MR. GEORGE W. HARRISON, joint managing director of Lofthouse and Saltmer, Ltd., manufacturing chemists, has left estate valued at £12,887 (net personalty £12,475).

AT the closing session of the British Pharmaceutical Conference in Birmingham last week, MR. H. HUMPHREYS JONES, who has been proprietor and principal of the Liverpool School of Pharmacy for thirty-one years, was elected chairman for the coming year. In addition to his pharmaceutical qualifications, Mr. Jones was elected a Fellow of the Chemical Society in 1909 and an Associate of the Institute of Chemistry in 1919. He subsequently passed the Institute's examination for the Fellowship in the analysis of food and drugs.

Mr. H. Humphreys Jones.

OBITUARY

MR. THEODORE L. WENGER, a director of Wengers, Ltd., ceramic, colour, etc., manufacturers, Stoke-on-Trent, has died at Melbourne, Australia. He went to Australia on business last year and had been ill since January.

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MR. PETER MCGREGOR, chairman and managing director of Sanderson Brothers and Newbould, and for many years a member of the executive committee of the National Federation of Iron and Steel Manufacturers and of the Council of the Sheffield Chamber of Commerce, has died in London at the age of 73.

CHEMICAL MATTERS IN PARLIAMENT

Industrial Subsidies

In a written reply to a question in the House of Commons, the Chancellor of the Exchequer stated that between 1924 and 1939, £79,497,954 had been distributed in the shape of direct subsidies to various industries. The chief recipients were sugar beet, £42,712,104; dye industry, £2,875; and land fertility, £1,961,513.

IT has been decided by the Japanese Department of Commerce and Industry to include soap among those export goods requiring inspection under the Important Export Merchandise Control Law. It has just issued a revised departmental ordinance covering the regulations for the application of this Law and this is to come into operation at the beginning of October. Toilet soap, washing soap, and alkaline soap used in the textile industry are included but not soap in liquid or cream form. Japanese exports of soap have increased considerably of late years, the export value during 1938 amounting to 7,800,000 yen, and exports so far this year are about 30 per cent. above those in 1938. The inspection of soap for export has hitherto been conducted by the Japanese Soap Exporters' Association.

General News——From Week to Week

AN EXPLOSION on Tuesday at the works of the Standard Fireworks Co., of Huddersfield, caused the death of a chemical worker. The deceased was alone in a wooden hut, grinding powder when the explosion occurred.

THE HALF-YEARLY STATISTICAL REPORT relating to new companies registered in England during the half-year ended June 30, 1939, published by Jordan and Sons, Ltd., company registration agents, shows that during the period two public companies of total capital £2,000 and 270 private companies of total capital £1,106,300 were registered in the chemicals class.

KEY INDUSTRY DUTY.—A representation has been made to the Board of Trade under Section 10(5) of the Finance Act, 1926, regarding secondary butyl alcohol. Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, before August 21, 1939.

THE FOLLOWING AWARDS FOR 1939-40 have been made by the Salters' Institute of Industrial Chemistry and approved by the Court of the Salters' Company: Fellowships have been renewed in the case of Messrs. A. Cameron (Cambridge University), H. S. Corran (Cambridge University) and J. L. Tuck (Oxford University). Fellowships have been awarded to R. Scarisbrick (Cambridge University), T. W. Walker (London University), and J. A. Berriman (Cambridge University). The Salters' Institute has also awarded 44 Grants-in-Aid to young men employed in chemical works in or near London to assist them in their studies.

ONE HUNDRED AND NINE ORIGINAL STUDIES OF WELDING by practical men in various branches of industry are contained in the book *Arc Welding in Design, Manufacture and Construction*, published by the international James F. Lincoln Arc Welding Foundation. These studies are the outstanding papers of the recent £40,000 Award Programme. Among the papers of particular interest to chemical engineers are those contained in Section 8, covering tanks, piping and the welding of nickel steel. At the end of every paper is given the cost of saving which results from the use of welding on that particular product. *Arc Welding in Design, Manufacture and Construction*, which contains upwards of 1,400 pages, is published at the nominal price of 9s. 6d. (post free) by the Lincoln Electric Co., Ltd., Welwyn Garden City, Herts.

THE FIRST OF TWO FURNACES included in an extension scheme costing £3,500,000 at the Appleby and Frodingham Works, Scunthorpe, of the United Steel Co., Ltd., was lighted on Monday by Captain R. S. Hilton, managing director of the company. The extensions were started just over two years ago, and the other furnace will start production next week. Each furnace is capable of producing 3,500 tons of pig iron a week from the low-grade Frodingham ore. The crushed ore is mixed in a special device, the ore bedding plant, which is unique in the industry, but is being copied for the great works being built at Saltzgitter, Germany. The first battery of 66 coke ovens has already been put into commission, and from this belt conveyors carry the coke to the furnaces. The capacity of the ovens is 6,600 tons a week. The Duke of Gloucester will formally open the plant in October.

AT A CONFERENCE held last week between Imperial Chemical Industries, Ltd., and representatives of the National Union of General and Municipal Workers, the Transport and General Workers' Union, the Mid-Cheshire Salt and Chemical Industries Allied Workers' Union, and the Federation of Trade Unions of Salt Workers, Alkali Workers, Mechanics and General Labourers, the company agreed to a general advance of wages to its chemical, explosives, leathercloth, paints, and quarry workers, numbering approximately 32,000. The basis of the advance is the adoption of a minimum rate of £3 per week to adult male labour, with a corresponding advance to those whose rates are graded above the present minimum. In the case of adult females, the minimum rate will be raised to 36s. The advance is to be operated in two instalments—October 2, 1939, and April 1, 1940, and varies in the case of adult males from 4s. 2d. to 6s. per week according to whether an individual is a plain time worker, a worker on payment by results, or a continuous shiftworker. Advances were also agreed for male and female juveniles. The advances are to continue in force at least until Decembr 31, 1940, and threafter until further notice, subject to certain reservations.

UNTIL JUNE 30, 1940, the price of Chilean nitrate of soda, for industrial purposes, will be £8 5s. net per ton of 2,240 lb. in 6-ton gross weight lots, delivered carriage paid to works. For smaller lots delivered carriage paid, surcharges are as usual, a 5s. allowance on any quantity taken ex port warehouse is made.

ANOTHER CHEMICAL WORKS—one is already planned for South Shields river-front—may be established at Marsden, just outside South Shields borough boundary. Negotiations are almost complete for a private company to take over disused paper mills and convert them into a works for producing lead and zinc acetates.

CONTINUED IMPROVEMENT is shown by the June shipments of china clay and china stone despite the fact that the European situation is seriously affecting the markets in Germany, France and the United States. The aggregate shipments for June were 71,766 tons, against 65,245 tons for the previous month. For the first six months of 1939 the total deliveries were 368,959 tons of china clay, 19,519 tons of china stone, 11,770 tons of ball clay, compared with 298,345 tons of china clay, 17,291 tons of china stone, and 7,133 tons of ball clay during the first six months of 1938—an increase in the aggregate of 77,489 tons.

UNDER A 20-YEAR AGREEMENT reached between the United Kingdom Gas Corporation and the Yorkshire Coking and Chemical Co. financial arrangements have been made for the erection by the latter company at Glass Houghton of a £32,000 gas-purifying plant, in which up to 5,000,000 cubic feet of crude gas per day can be purified. The gas will be purchased by the United Kingdom Gas Corporation for augmenting the grid supply to meet increasing demand. The Glass Houghton supply will be in addition to an output of 6,700,000 cubic feet a day from the large coking plant now nearing completion at Hemsworth pithead and bulk supplies from other pithead plants to be established in the grid area.

THE REPORT OF PROGRESS in the Special Areas during June states that three tenants took possession of factories on the Team Valley Trading Estate during the month. At the end of the month, the total number of completed factories on the Estate was 115 of which 98 were in production, employing 2,641 people. Thirteen further factories were under construction for prospective tenants. Leases for 18 additional factories had been arranged and other negotiations were in progress. On the South Wales Trading Estate at Treforest, 8 tenants took possession of factories during June. Construction of 6 further factories was begun. At the end of June the total number of completed factories on this estate was 59, of which 53 were occupied, giving employment to 2,196 people. A further 19 factories were under construction for tenants, and negotiations for other tenancies were in progress. The Commissioner's total commitments at the end of June in respect of all the Special Areas in England and Wales were approximately £19,429,000. The total expenditure involved, excluding the capital brought into the Areas by new firms being established on the Trading Estates and elsewhere, was more than £26,000,000.

Foreign News

IMPORTS OF CREOSOTE into America showed an increase of 60 per cent. for the first quarter of this year compared with the same period of 1937.

NEW AUSTRALIAN COMPANIES.—Pharmaceutical products colours, etc., are to be manufactured by the Mitchell McMahon Proprietary, Ltd., a new company, registered in Sydney, with a capital of £10,000. The Hardie Trading Proprietary, Ltd., a new company at Footscray, Melbourne, has commenced the manufacture of aeroplane dopes.

NEARLY A QUARTER OF SWISS TOTAL EXPORTS are chemical, states a new publication "Switzerland and Her Industries," published from Lausanne. Pharmaceutical products, perfumes, and dyes provide half the exports from the 267 native chemical factories, which employ 20,000 persons, and are chiefly centred in Basle, Zofingen, Berne and St. Gall. Tar distillation is largely used for the manufacture of pharmaceuticals, the export of which last year was 51 million Swiss francs. Exports of perfumes, made at Geneva and Nyon from tar products, volatile oils and vegetable extracts, amounted to 12½ million francs.

IT HAS BEEN REPORTED that the German Government has come to an agreement for the purchase of the Witkowitz metallurgical works in Bohemia. The figure of £3,000,000 is mentioned as the price.

HIGH-MELTING WAXES formed as by-products of hydrogenation petrol manufacture are now being offered by the Courrières-Kuhlmann concern in France and are finding a principal outlet in candle manufacture.

AS FROM AUGUST 1, next, manufactured perfumes offered for sale in Italy must state on their labels a description (in Italian) of the exact place of manufacture, and other particulars by order of a recently-promulgated Royal Decree.

BENEFITING FROM THE TERMS of the recent German-Rumanian trade agreement, Germany hopes to obtain exploitation rights over the 1,200 square miles of marshland in the Danube Delta, according to the *Bz. am Mittag*. Four-fifths of this marsh area is covered with reeds and osiers said to be ideal materials for the manufacture of cellulose.

A DECREE has been promulgated in France prohibiting, provisionally, glycerine export and re-export, following warehousing, transit or transhipment. Exceptions, however, may be granted. Goods which were sent abroad prior to June 24 may be exported under the rules formerly in operation. Glycerine export was restricted by a decree of September 24, 1938, which was suspended in October, 1938.

A CONTINUOUSLY OPERATING PLANT for chlorination of town sewage designed by E. Gori-Carradori (Ital. Pat. 361,161) has been constructed at Novoli. The principal effect of chlorination is to interrupt the process of putrefaction and involves the use of 0.7 to 0.8 per cent. chlorine which leads to an exothermal rise in temperature from 75° to 85° C. The heating effect facilitates drying in an air current when the initial weight of material is reduced by some 35 per cent. The final product is a valuable fertiliser because of its content of oxidative biochemical activators and is recommended in admixture with small quantities of phosphates, bone ash and nitrogenous products.

THE SUCCESSFUL UTILISATION OF LIQUEFIED GASES as fuel for motor transport is reported by the Soviet Institute of Research of the Automobile and Tractor Industries. A combination of liquefied butane and propane has been used in the experiments. Since these gases can be liquefied under normal temperatures at relatively low pressure (3 to 12 atm.), the fuel can be kept in light-duty balloons. It has been found to possess higher anti-knock properties than ordinary petrol and the engine can also be started more easily. To switch over to liquefied gas, vehicles have to be fitted with auxiliary equipment, which is neither cumbersome nor expensive; engines working on the new fuel can easily be adapted for ordinary petrol.

36,000 METRIC TONS OF TOILET SOAP were sold in Russia last year and to satisfy the demand new soap factories producing 20,000 tons a year will be erected during the third Five Year Plan period. During the current year, the Troitskii soap factory near Cheliabuisk will be brought to full capacity of 7,000 tons of household soap per year. It is also reported that one of the Moscow factories will, in the near future, put on the market, soap flakes for washing silk and rayon goods. The Russian perfume industry is also being expanded; several factories are being doubled in capacity and a new factory is to be built in Novosibirsk. The Kaluga perfume combine will commence operation next year and will produce synthetic aromatics most of which have been imported hitherto.

ON SUNDAY LAST a balloon flight was held at Cologne, in which ten free balloons participated, including one called "D. Buna" which went through a form of ceremonial christening to mark the introduction of the German rubber substitute Buna into a new field (or perhaps we should say aerial sphere). In view of the strenuous efforts now being made in Germany to use the new synthetic rubber in all possible ways this test of its possibilities as material for balloon envelopes is of considerable interest. Previous general tests had already shown its superiority to natural rubber in the matter of resistance to ageing, and the special trials lately made have also shown that it remains—unlike the natural product, so the makers claim—perfectly gas-tight even after prolonged soaking. It has also been tried out under hot sun at Cairo and here again exposed at the same time to thorough wetting. It is said to have stood up well to these severe tests, and its suitability for balloon manufacture is likely to be particularly valuable, especially from a military point of view.

GLYCERINE IMPORTS into British India, last year, were 4,417 cwts. (value 215,701 rupees) being nearly four times more than for 1937.

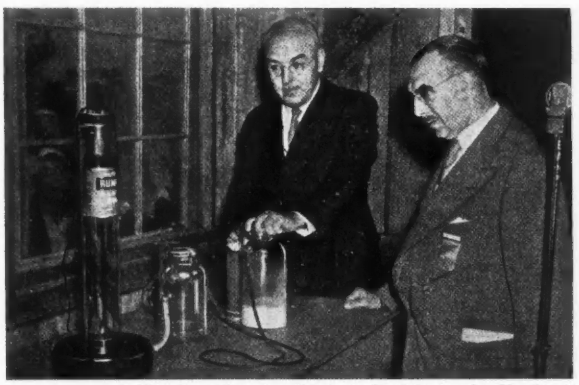
PRODUCTION OF CORUNDUM from foreign bauxite with an annual capacity of 1,500 tons has been commenced in Sweden by Höganas-Billesholms A.B.

MORE ACETONE is being bought by Cuba, 71,263 kilogs being her imports last year, against 38,294 kilogs in 1937. U.S.A. has the bulk of the trade, and Germany gets nearly the whole balance.

BY GOVERNMENT DECREE the individual concerns in the Portuguese rosin industry have been merged into a corporation under the style of Uniao dos Gremios de Industriais e Exportadores de Produtos Resinosos.

A NEW MIXED FERTILISER to be produced at Beresniki in the Urals will differ from the purely mechanical mixtures hitherto produced in Russia in containing nitrogen, potash and phosphorus in the form of homogeneous crystals.

THE 80TH ANNIVERSARY of the foundation of the Rumford Chemical Works, East Providence, U.S.A., and of the introduction of its principal product—baking powder—was celebrated recently. During the celebration the Rumford Museum of early chemical and industrial equipment was dedicated and a bust



[With acknowledgments to "Industrial and Engineering Chemistry."

The opening of the Rumford Museum at the Rumford Chemical Works, U.S.A., by Mr. H. M. Wriston, President of Brown University, and Mr. A. E. Marshall, President of the Company.

of Benjamin Thompson, Count Rumford, unveiled. The dedication ceremony was performed by mixing baking powder and water in a gas generator connected to a water storage bottle which was connected in turn to a cylinder containinf an empty baking powder tin. The carbon dioxide generated displaced water from the storage bottle into the cylinder. The baking powder tin floated on the water and on reaching the top of the cylinder closed an electrical circuit starting a mechanism which opened the doors of the museum.

WHEN THE CHEMICAL EXPOSITION is held at Grand Central Palace, New York, this year, during the week of December 4 to 9, it will celebrate the completion of its 25th year of service to the chemical and allied industries. At present a total of 280 exhibitors have made contracts to exhibit, and over 200 of these have been participants in the Chemical Exposition in previous years. Exhibit classifications will include chemicals and chemical products, laboratory equipment and supplies, instruments of precision, materials handling equipment, brewing, distilling and bottling equipment, industrial chemical machinery and materials, containers and packaging machinery, and materials of construction. Unit processes of chemical engineering will be represented by a broad range of exhibits. Combustion processes will feature furnaces, kilns, refractories, and the recording instruments essential for regulation and control. Crushing, grinding, and mechanical separation will be represented by sifters, agitators, classifiers, and ball mills. Classification of materials based on magnetic properties will also be featured. Advances in the processes of filtration, evaporation, and drying will be illustrated by many exhibits. Apparatus will include filters of every type and evaporating equipment applicable not only to the chemical industries, but to the food industries as well. Drying equipment will be shown in its relation to every phase of the pharmaceutical industry and there will be special reference to the processing of foods.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF UREA ARTIFICIAL RESINS.—Albert Products, Ltd. (Germany, July 19, '38.) 20982.

MEANS FOR FEEDING SUBSTANTIALLY UNIFORM MIXTURES of gaseous fluid and entrained particles.—Babcock and Wilcox, Ltd., and H. McNeil. 20546.

TREATMENT OF MATERIAL such as leather with liquid.—British United Shoe Machinery Co., Ltd. (United Shoe Machinery Corporation). 20809.

GLUCOSIDIC COMPOUNDS.—A. Chwala. (Germany, July 15, '38.) 20792; (Germany, Oct. 31, '38.) 20793; (Germany, March 22.) 20794.

COMPOSITIONS containing organic sulphates.—Colgate-Palmolive-Peet Co. (United States, July 15, '38.) 20409.

METHOD OF PRODUCING POROUS CERAMIC BODIES.—Compagnie Generale d'Electro-Ceramique. (Germany, July 30, '38.) 20862.

METHOD FOR PRODUCING, ETC., A FUNGICIDE for agricultural purposes.—W. J. Craven and Co., Ltd., and W. J. Craven. 20370.

MANUFACTURE OF ASBESTOS CEMENT TILES.—A. E. E. Cuckow, and A. J. Drew. 20625.

MANUFACTURE OR THE PRODUCTION OF ACROLEIN.—Deutsche Gold- und Silber Scheideanstalt vorm. Roessler. (Germany, Aug. 9, '38.) 20999.

FIXING OF WOOD VENEER directly on to urea formaldehyde and phenol formaldehyde by one operation.—G. E. Serase-Dickens. 20677.

PROCESS FOR THE GENERATION OF SYNTHESIS GAS with the simultaneous recovery of aromatic hydrocarbons.—Didier-Werke, A.-G. (Germany, Aug. 27, '38.) 20704.

MANUFACTURE OF UNSATURATED ESTERS.—Distillers Co., Ltd., H. P. Staudinger, and H. K. Tuerck. 20484.

PRODUCTION OF CELLULOSE DERIVATIVE, ETC.—H. Dreyfus, R. W. Moncrieff and H. Bates. 20826, 20827.

ALUMINIUM CONTAINERS for hydrogen peroxide.—E. I. du Pont de Nemours and Co., J. S. Reichert, and W. S. Hinegardner. 20458.

STABILISATION OF VINYL ACETATE.—E. I. du Pont de Nemours and Co., and G. S. Stamatoff. 20550.

PREPARATION OF EXPLOSIVE COMPOSITIONS for detonating rivets. A. Dynamit-A.-G. vorm. Nobel and Co. (Germany, July 16, '38.) 20763.

MANUFACTURE OF SUPERPHOSPHATE.—C. E. Every (Aktiebolaget Kemiska Patenter). 20774.

DETERMINATION OF HYDROGEN ION CONCENTRATION.—Fides Ges. für die Verwaltung und Verwertung von Gewerblichen Schutzrechten. (Germany, July 16, '38.) 20662.

PRODUCTION OF THIO-ETHERS, ETC.—J. G. Fife (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). 21008.

PRODUCTION OF HIGHLY ACTIVE SILVER CATALYSTS.—J. G. Fife (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). 21009.

PRODUCTION OF ETHYLENE OXIDE.—J. G. Fife (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). 21010.

PROCESS FOR COLOURING COLLOIDS.—B. Gaspar. 20952.

MANUFACTURE OF DISAZO DYESTUFFS.—J. R. Geigy, A.-G. (Switzerland, July 19, '38.) 20728.

PRODUCTION OF A VITAMIN E CONCENTRATE, ETC.—General Mills, Inc. (United States, Sept. 24, '38.) 20566.

PRODUCTION OF VITAMIN EMULSIONS, ETC.—General Mills, Inc. (United States, Sept. 22, '38.) 20567.

PRODUCTION OF A CONCENTRATE of naturally occurring vitamin E, etc.—General Mills, Inc. (United States, July 18, '38.) 20568.

APPARATUS FOR CONTINUOUS EXTRACTION OF THE CARBONIC OXIDE, etc., from gaseous industrial mixtures.—L. Lombard-Gerin. (France, July 15, '38.) 20616.

PRODUCTION OF EFFECTS ON TEXTILE MATERIALS.—W. W. Groves (I. G. Farbenindustrie.) 20531.

PERYLENETETRACARBOXY-BIS-PHENYLIMIDE DERIVATIVES.—N. H. Haddock, F. P. Reed, and Imperial Chemical Industries, Ltd. 20549.

COATING COMPOSITIONS, ETC.—A. C. Hetherington, G. W. Lobb, and Imperial Chemical Industries, Ltd 20879.

MANUFACTURE OF DYESTUFFS of the phthalocyanine series.—I. G. Farbenindustrie. (Germany, July 14, '38.) 20433; (Germany, June 17.) 20434.

MANUFACTURE OF DYESTUFFS of the phthalocyanine series.—I. G. Farbenindustrie. (Germany, July 15, '38.) 20552; (Germany, June 7.) 20553.

MANUFACTURE OF DRIERS.—I. G. Farbenindustrie. (April 1, '38.) (Germany, April 1, '37.) 20832.

MANUFACTURE OF ZINC COMPOUNDS.—I. G. Farbenindustrie and Duisburger Kupferhütte. (Germany, July 19, '38.) 20907; (Germany, July 19, '38.) 20908; (Germany, July 23, '38.) 20909; (Germany, Aug. 5, '38.) 20910.

MANUFACTURE, ETC., OF DEHYDROGENATION PRODUCTS of hydroxy compounds.—G. W. Johnson (I. G. Farbenindustrie.) 20814.

OXIDATION OF CELLULOSE.—Kodak, Ltd. (United States, July 15, '38.) 20683.

MANUFACTURE OF FILMS, ETC., of cellulose derivatives.—Kodak, Ltd. 20682.

MANUFACTURE OF CEMENTITIOUS, ETC., PRODUCTS, ETC.—Lignocrete, Ltd., and G. O. Case. 20711.

PRODUCTION OF CELLULOSE DERIVATIVES.—R. W. Moncrieff, H. Bates, and H. Dreyfus. 20825.

PRODUCTION OF SATURATED HYDROCARBONS, ETC.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Netherlands, Aug. 9, '38.) 20560; (Netherlands, Sept. 16, '38.) 20561; (Netherlands, Nov. 10, '38.) 20562; (Netherlands, Dec. 7, '38.) 20563.

PROCESS FOR CONCENTRATING SOLUTIONS of capillary-active substances.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Netherlands, Aug. 9, '38.) 21011.

METHOD OF PRODUCING MIXTURES for the rubber, etc., industries. Naftolen-Ges. zur Verwertung der Rostler-Mehner'schen Verfahren. (Germany, July 15, '38.) 20540.

METHOD OF PRODUCING SODIUM BICARBONATE in the ammonia-soda process.—A. M. Oswald. 20904.

DISTILLATION OF COAL, ETC.—J. C. Overton, and Phoenix Oil Extractors (Proprietary), Ltd. 20710.

PRODUCTION OF CELLULOSE DERIVATIVES.—F. H. Reichel. 20906.

MANUFACTURE OF THE CORTICOTROPIC HORMONE.—Schering, A.-G. (Germany, July 29, '38.) 20551.

SULPHUR-CONTAINING CONDENSATION PRODUCTS.—Silesia Verein Chemischer Fabrieken. (Germany, July 28, '38.) 21012.

MANUFACTURE OF VAT-DYESTUFFS.—Soc. of Chemical Industry in Basle. (Switzerland, July 20, '38.) 20960; (Switzerland, Dec. 5, '38.) 20961.

OXIDATION OF LOW MOLECULAR WEIGHT HYDROCARBONS in liquid phase, etc.—Standard Oil Development Co. (United States, Oct. 12, '38.) 20595.

MANUFACTURE OF POLY-SUBSTITUTED ETHYLENE COMPOUNDS.—Soc. of Chemical Industry in Basle. (Switzerland, July 13, '38.) 20414.

TREATMENT OF HYDROCARBON OILS.—Standard Oil Co. (Indiana). (United States, July 16, '38.) 20656.

CATALYTIC SYNTHESIS OF HYDROCARBONS.—Synthetic Oils, Ltd., and W. W. Myddleton. 20631.

MANUFACTURE OF MONO- AND DIMETHYL FORMAMIDES.—W. Tyerman, and Imperial Chemical Industries, Ltd. 21015.

CONTINUOUSLY-OPERATING VERTICAL RETORT for the production of synthesis gas.—Woodall-Duckham (1920), Ltd. (Didier-Werke, A.-G.). 20705.

MANUFACTURE OF PIGMENTS of the phthalocyanine series.—M. Wyler, and Imperial Chemical Industries, Ltd. 20769.

Complete Specifications Open to Public Inspection

PRODUCTION OF STABLE, CONCENTRATED, AQUEOUS SOLUTIONS OF THEOPHYLLINE and caffeine, suitable for injections.—Knoll, A.-G. Chemische Fabriken. Jan. 15, 1938. 34929/38

PREVENTING THE CORROSION OF MAGNESIUM and magnesium-base alloys.—Magnesium Elektron, Ltd. Jan. 15, 1938. 36233/38.

METHOD OF PRODUCING DISULPHONAMIDES.—Calco Chemical Co., Inc. Jan. 11, 1938. 37847/38.

CONCENTRATING BARITE from its ores.—Phosphate Recovery Corporation. Jan. 15, 1938. 38/39.

MANUFACTURE OF ISATIN DERIVATIVES.—J. R. Geigy, A.-G. Jan. 14, 1938. 667/39.

POLYMERIC MATERIAL.—E. I. du Pont de Nemours and Co. Jan. 14, 1938. 787/39.

PROCESS FOR THE MANUFACTURE OF AMIDE DERIVATIVES of homologues of 3, 5-dimethyl isoxazole carboxylic acids.—Hoffman-La Roche and Co., Ges., F. Jan. 17, 1938. 798/39.

PROCESS FOR THE MANUFACTURE OF ALUMINIUM.—Soc. D'Electro-Chimie, D'Electro-Metallurgie, et des Acieries Electriques D'Ugine. Jan. 11, 1938. 867/39.

MANUFACTURE OF UNSATURATED ALIPHATIC COMPOUNDS.—British Celanese, Ltd. Jan. 11, 1938. 946/39.

ACIDS OF THE ETIOCHOLANE SERIES.—Naamlooze Vennootschap Organon. Jan. 13, 1938. 1100/39.

DERIVATIVES OF THE CYCLOPENTANODIMETHYLPOLYHYDROPHENANTHRENE SERIES.—Naamlooze Vennootschap Organon. Jan. 13, 1938. 1101/39.

MANUFACTURE OF SURFACE ACTIVE MATERIALS and their application.—E. I. du Pont de Nemours and Co. Jan. 13, 1938. 1264/39.

MANUFACTURE OF DIAKYL ETHERS of glycerine.—E. I. du Pont de Nemours and Co. Jan. 13, 1938. 1265/39.

PRODUCTION OF BERYLLIUM ALLOYS.—Beryllium Corporation. Jan. 14, 1938. 1360/39.

COLOURING ALUMINIUM or its alloys.—Soc. of Chemical Industry in Basle. Jan. 15, 1938. 1419/39.

PROCESS FOR THE MANUFACTURE OF MONOAZO-DYESTUFF SULPHONIC ACIDS.—I. G. Farbenindustrie. Jan. 17, 1938. 1501/39.

LAMINATED MATERIALS.—Imperial Chemical Industries, Ltd. Jan. 14, 1938. 1505/39.

METHOD OF RECOVERING SULPHUR DIOXIDE.—M. Guggenheim, S. R. Guggenheim, E. A. C. Smith, and M. G. B. Whelpley (trading as Guggenheim Bros.). Jan. 17, 1938. 1467/39.

MANUFACTURE OF WATER-GLASS CEMENTS resistant to water and acids.—I. G. Farbenindustrie. Jan. 17, 1938. 1583/39.

Specifications Accepted with Date of Application

PROCESS FOR THE MANUFACTURE OF EPITHIO-ALKANES.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Feb. 16, 1938. (Sample furnished.) 508,932.

METHOD OF MELTING MAGNESIUM AND MAGNESIUM BASE ALLOYS in induction furnaces.—Magnesium Elektron, Ltd. April 21, 1938. 508,670.

PREPARATION OF ARTIFICIAL SILK, ARTIFICIAL SPUN FIBRES, horsehair, bands, films and the like from soya bean casein.—E. Potter (Akt.-Ges. für Vermogensverwertung). Nov. 26, 1937. 508,840.

CASE-HARDENING OF FERROUS METALS.—Wild-Barfield Electric Furnaces, Ltd., E. P. Barfield, and J. E. Oram. Jan. 8, 1938. 509,302.

MANUFACTURE AND PRODUCTION OF WATER-SOLUBLE CONDENSATION PRODUCTS.—I. G. Farbenindustrie, and G. W. Johnson. Jan. 10, 1938. 509,303.

PURIFICATIION OF SUGAR SOLUTIONS.—Naamlooze Vennootschap Octrooien Maatschappij Activit. Jan. 11, 1937. 509,401.

REDUCTION OF ZINC, cadmium, and mercury.—H. A. Blackwell, and W. L. Turner. Jan. 11, 1938. 509,148.

MANUFACTURE OF STEEL and alloy steel.—F. P. Mehta. Jan. 21, 1937. 509,404.

DEPHOSPHORISING OF STEEL.—F. P. Mehta. Jan. 21, 1937. 509,306.

DYEING OF CELLULOSE or cellulose derivative textile materials.—Courtaulds, Ltd., and T. H. Morton. Jan. 11, 1938. 509,407.

DYEING OF CELLULOSE or cellulose derivative textile materials.—Courtaulds, Ltd., and T. H. Morton. Jan. 11, 1938. 509,408.

DEGREASING OF METAL ARTICLES.—N. R. Hood, S. B. Spencer and Imperial Chemical Industries. Jan. 11, 1938. 509,154.

MANUFACTURE OF DIPARA-DIAMINO DIPHENYLSULPHOXIDES.—A. Carpmael (I. G. Farbenindustrie.) Jan. 13, 1938. 509,415.

PRODUCTION OF FAST DYEINGS.—W. W. Groves (I. G. Farbenindustrie.) Jan. 17, 1938. 509,433.

MANUFACTURE AND USE OF COMPOUNDS of the betaine type.—Deutsche Hydrierwerke, A.-G. Jan. 16, 1937. 509,435.

RECOVERY OF GASOLINE.—Houdry Process Corporation. Feb. 27, 1937. 509,268.

CATALYTIC SYNTHESIS OF HYDROCARBON OILS from gaseous mixtures of carbon monoxide and hydrogen.—W. W. Myddleton. Jan. 22, 1938. 509,325.

CONVERSION OF MIXED ISO- and normal butanes to liquid hydrocarbons.—Standard Oil Development Co. March 16, 1937. 509,160.

MANUFACTURE AND PRODUCTION OF NITROGENOUS PRODUCTS.—I. G. Farbenindustrie, and G. W. Johnson. Feb. 9, 1938. 509,334.

SOAP PRODUCTS and the manufacture thereof.—Lever Bros. and Unilever, Ltd., R. Thomas, and H. B. Oakley. Feb. 23, 1938. (Addition to 492,719.) 509,343.

PREPARING CARBON BLACK and hydrogen.—W. W. Triggs Bayerische Stickstoff-Werke, A.-G.). Feb. 23, 1938. 509,166.

METHOD OF CONTINUOUSLY PURIFYING MOLASSES.—Aktiebolaget Separator. Feb. 27, 1937. 509,347.

MANUFACTURE AND PRODUCTION OF 2-METHYL-BUTANEDIOL-1.3.—G. W. Johnson (I. G. Farbenindustrie.) Feb. 25, 1938. 509,348.

ISOLATION OF STEROLS.—Parke, Davis and Co. March 12, 1937. 509,062.

PROCESS FOR MANUFACTURING ANTI-KNOCK MOTOR FUELS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. June 15, 1937. (Samples furnished.) 509,349.

STEROL DERIVATIVES and process of making same.—Parke, Davis and Co. March 12, 1937. 509,063.

LOW-TEMPERATURE METHOD OF, and apparatus for, removing the vaporizable contents from carbonaceous materials.—A. C. Russell, and C. W. Garven. March 25, 1937. 509,354.

INSECTICIDES and the like.—Corporate Industries, Ltd. March 24, 1938. 509,275.

FIRE-RESISTING COMPOSITIONS for coating or impregnating textile materials and other articles.—British Insulated Cables, Ltd., F. J. Brislee, and L. Macfarlane. March 31, 1938. 509,069.

WATERY DISPERSIONS OF PARAFFIN and other waxes, bitumen, oils and fats, and their use for sizing and waterproofing paper, textile fabric, and similar fibrous material.—A. Halward, and P. Muranyi. April 5, 1938. 509,174.

PURIFICATION OF SOLUTIONS in a circulation process for the electrolytic production of hydrogen peroxide.—W. J. Tennant (Henkel and Cie, Ges.). April 6, 1938. 509,175.

PREPARING NUCLEARLY SUBSTITUTED AROMATIC ETHER HALIDES.—Rohm and Haas Co. May 3, 1937. 509,176.

MANUFACTURE OF LUBRICATING-OILS, insulating-oils, and similar oils.—Standard Oil Development Co. Aug. 17, 1937. 509,071.

MANUFACTURE AND PRODUCTION OF FATTY ACID ESTERS of monochlorhydrin.—G. W. Johnson (I. G. Farbenindustrie.) April 20, 1938. 509,072.

SEPARATION OF DIHYDRO-EQUILIN and oestradiol.—Schering, A.-G. April 30, 1937. 509,075.

MANUFACTURE AND PRODUCTION OF NICKEL poor in carbon.—G. W. Johnson (I. G. Farbenindustrie.) April 28, 1938. 509,076.

REMOVING WAX from fluid hydrocarbons.—Aktiebolaget Separator-Nobel. May 3, 1937. 509,181.

TREATMENT OF TEXTILE MATERIALS with artificial resin.—Rohm and Haas Co. May 11, 1937. 509,079.

PRODUCTION OF OLEFINE OXIDES.—U. S. Industrial Alcohol Co. May 8, 1937. 509,183.

MANUFACTURE OF DYESTUFFS containing metal.—Soc. of Chemical Industry in Basle. May 19, 1937. 509,360.

METHOD OF PREPARING WATER-SOLUBLE DERIVATIVES of the indole series.—J. R. Geigy, A.-G. May 19, 1937. 509,455.

SEPARATING PHENOLS from tar oils and like products.—H. Wittek. June 5, 1937. 509,083.

METHOD OF CHLORINATING FINELY DIVIDED CHROMITE.—Great Western Electro-Chemical Co. June 15, 1937. 509,368.

PRODUCTION OF COLOURED FILAMENTS, foils, or other structures from viscose.—Schlesische Zellwolle, A.-G. June 19, 1937. 509,085.

TREATMENT OF RUBBER.—United States Rubber Products, Inc. July 7, 1937. 509,459.

PRODUCTION OF OLEFINE POLYMERS.—Standard Oil Development Co. Oct. 2, 1937. 509,463.

PREPARING HIGHER FATTY ALDEHYDES.—A. W. Ralston, and R. J. V. Wal. Sept. 6, 1938. 509,203.

PRODUCTION OF NITRITE ESTERS of non-phenolic organic compounds.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Sept. 17, 1937. 509,204.

PROCESS FOR THE MANUFACTURE OF LUBRICATING-OILS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Sept. 18, 1937. 509,097.

PRODUCTION OF ARTIFICIAL THREADS from cellulose solutions.—Rheinische Zellwolle, A.-G. Sept. 23, 1937. 509,375.

RE-VAPORISATION OF LIQUID OXYGEN.—Linde Air Products Co. Nov. 9, 1937. 509,105.

DISSOLVING AND RE-PRECIPITATING COPPER in metallic form.—Norddeutsche Affinerie. Dec. 20, 1937. 509,112.

ALUMINIUM ALLOYS.—W. H. A. Thiemann (I. G. Farbenindustrie.) Jan. 10, 1938. 509,465.

New Companies Registered

East London Manufacturing Co., Ltd. 354,116.—Private company. Capital £200 in 200 ordinary shares of £1 each. To acquire the business of general merchants carried on by H. H. Lott and A. Sceats at 105 Boleyn Road, East Ham, Essex, and to carry on business as manufacturers of and dealers in paint, creosote, tar and disinfectants, manufacturing chemists, etc. Directors: Herbert H. Lott, 1 Buckingham Road, E.18; Alfred Sceats. Registered office: 105 Boleyn Road, East Ham, E.6.

Soya Mills, Ltd. 354,104.—Public company. Capital £25,000 in 16,000 ordinary shares of £1 each and 18,000 6 per cent. cumulative preference shares of 10s. each. To carry on the business of planters, cultivators and millers of soya beans and other produce, manufacturers of bye-products of soya beans, fertiliser manufacturers and dealers, farmers, etc. Directors: G. A. Washington Fryatt, "Vagniacis," River Ash Estate, Shepperton, Middlesex; Wm. Hughes. Registered office: Potters Farm, Ewelme, Oxford.

Sunbeam Anti-Corrosives, Ltd.—353,781. Private company. Capital, £100 in 100 shares of £1 each. To carry on the business of manufacturers and workers of and dealers in anti-corrosive products, plating, varnishing, polishing, spraying and finishing materials, lacquer, cellulose, enamel, varnish and chemicals, chemical substances and processes of all kinds, etc. Directors: Allan B. Charter, 14 Madrid Road, Barnes, S.W.13; Joseph J. Lorant. Registered office: "Arcturus Works," Queens Road, Battersea, S.W.8.

Electro-Chemical Engineering Co., Ltd. 353,240.—Private company. Capital £9,000 in 9,000 shares of £1 each. To carry on the business of contractors, builders, civil, electrical, constructional, metallurgical, electro-metallurgical, mechanical, chemical, electro-chemical, mining and general engineers, electro-platers, miners, producers, refiners, smelters, reducers, storers, suppliers and distribution of ores, metals, minerals chemicals and chemical products, petroleum and substances of every kind, etc. Subscribers: Donald F. Campbell, 17 Victoria Street, S.W.1; Richard F. Norland. Registered office: 17 Victoria Street, S.W.1.

Doughty-Richardson Fertilizers, Ltd.—355,311. Private company. Capital, £100 in 100 shares of £1 each. To carry on the business of chemical and artificial manure manufacturers, manufacturers of and dealers in sulphate of ammonia, superphosphates, phosphate grinders, ammonia fixed or dissolved, and guano, seed crushers, oil refiners, manufacturers and importers of and dealers in oil cake, Peruvian and other guanos, nitrate of soda and sulphate of ammonia, fertilisers, fats, dips, sprays, vermifuges, fungicides, medicines and remedies. Directors: Frank G. C. Fison, Stutton Hall, Stutton, Ipswich; Peter T. Chevallier. The following four companies have also been registered with particulars similar to those of Doughty-Richardson Fertilizers, Ltd., viz.: Edwin Piercy and Son, Ltd.—355,315; Goole Tillage Co., Ltd.—355,319; Hart Bros. and Co., Ltd.—355,321; and W. G. Hammond and Co., Ltd.—355,338.

Weekly Prices of British Chemical Products

THE industrial chemical market has not been quite so active this week, most departments reporting a quiet but steady trade, conditions, however, are generally regarded as normal for the period. A fair volume of inquiry is circulating for most of the potash and soda products, and a good seasonal demand is reported for acetic, tartaric and citric acids. Quantities being called for against contracts are reported to be satisfactory, but hardly any fresh long-term buying is in evidence. There are no important price changes to record for general chemicals, rubber chemicals and wood distillation products. Very little change falls to be recorded in the market for coal tar products, business continuing to be rather restricted. There are no price features to report and values remain steady.

Price Changes

Rises: Potassium Prussiate.

MANCHESTER.—Holiday and other influences have tended to check fresh business on the Manchester chemical market during the past week, but in spite of these, trading conditions in respect of most of the heavy products have been fairly steady, whilst deliveries against contracts to the consuming industries in the Lancashire district have been fully maintained in most directions. Prices generally are on a steady to firm basis and little sign of weakness has been in evidence. With regard to the tar products, there is a good demand for benzols, toluols and certain other light materials and values are held.

GLASGOW.—Business in general chemicals for home trade has been quiet during the week, with little inquiry for export. Prices continue firm at about last week's figures with no important change to report.

General Chemicals

ACETONE.—£39 to £43 per ton, according to quantity.

ACETIC ACID.—Tech., 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech., glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE (see Salammoniac).—Firsts, lump, spot, £42 17s. 6d. per ton; d/d address in barrels. Dog-tooth crystals, £35 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

AMMONIUM DICHROMATE.—8¼d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £10 10s. per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £15 10s. per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contract. GLASGOW: £9 5s. per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16 per ton in 1-cwt. bags carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4⅜d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2⅝d. per lb.; liquor, £13 per ton d/d station in drums.

CHROMIC ACID.—9d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0¼d. per lb. MANCHESTER: 1s. 0¼d. GLASGOW: B.P. crystals, 1s. 0¼d. per lb; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in bags. MANCHESTER: £18 12s. 6d. per ton f.o.b. GLASGOW: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, £4 12s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. MANCHESTER: White, £31; brown, £30. GLASGOW: White crystals, £29 10s.; brown, £1 per ton less.

LEAD NITRATE.—£27 per ton for 1-ton lots.

LEAD, RED.—£30 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. GLASGOW: £30 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—GLASGOW: Ground, £30 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. GLASGOW: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY PRODUCTS.—Ammoniated B.P. (white precip.), lump, 6s. 5d. per lb.; powder B.P., 6s. 7d.; bichloride B.P. (corros. sub.), 5s. 8d.; powder B.P., 5s. 4d.; chloride B.P. (calomel), 6s. 5d.; red oxide cryst. (red precip.), 7s. 6d.; levig, 6s. 9d.; yellow oxide B.P. 6s. 10d.; persulphate white B.P.C., 6s. 7d.; sulphide black (hyd. sulph. cum. sulph. 50%), 6s. 6d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. MANCHESTER: £49 to £55 per ton ex store. GLASGOW: £2 9s. per cwt. in casks.

PARAFFIN WAX.—GLASGOW: 3¾d. per lb.

POTASH, CAUSTIC.—Solid, £33 5s. to £38 per ton according to quantity, ex store; broken, £40 per ton. MANCHESTER: £38.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. MANCHESTER: £37 per ton. GLASGOW: 4¼d. per lb.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. GLASGOW: 5¼d. per lb., net, carriage paid.

POTASSIUM CHROMATE.—7d. per lb., d/d U.K.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—LONDON: 9¼d to 10¼d. per lb. MANCHESTER: B.P. 9¼d. to 11¼d. GLASGOW: B.P. Crystals, 10¼d.

POTASSIUM PRUSSIATE.—6d. to 6½d. per lb. MANCHESTER: Yellow, 6d. to 6¼d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6¾d. per lb. net, ex store.

SALT CAKE.—Unground, spot, £3 8s. 6d. per ton.

SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £13 10s. per ton d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags in 1-ton lots. MANCHESTER: £10 15s. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags.

SODIUM BISULPHITE POWDER.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.
SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. GLASGOW: 4¼d. per lb., carriage paid.
SODIUM CHROMATE.—4½d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d. GLASGOW: £1 12s. per cwt. in 1-cwt. kegs, net, ex store.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.
SODIUM PRUSSIATE.—4d. per lb. for ton lots. MANCHESTER: 4¼d. to 5d. GLASGOW: 4d.
SODIUM SILICATE.—£8 2s. 6d. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 10s.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168°. Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.— 1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1¼d. per lb. GLASGOW: 1s. 1¼d. per lb., 5%, ex store.
ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2-cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7½d. to 1s. 2½d. per lb., according to quality. Crimson, 1s. 6½d. to 1s. 8d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £6 10s. per ton, according to quality.
CADMIUM SULPHIDE.—3s. 1d. to 3s. 4d. per lb.
CARBON BLACK.—3⅞d. to 4 1/16d. per lb., ex store.
CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 11½d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4¼d. to 5d. per lb.; dark 3⅜d. to 4⅜d. per lb.
LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.
ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d.; March, £7 17s. 6d.; April/June, £7 18s. 9d.
NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1939.
SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1939.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9. MANCHESTER: Crude, 1s. 0½d. to 1s. 0½d. per gal.; pure, 1s. 8d. to 1s. 8½d per gal.
CARBOLIC ACID.—Crystals, 6¾d. to 7¼d. per lb., small quantities would be dearer; Crude, 60's 1s. 7d. to 1s. 10d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.
CREOSOTE.—Home trade, 3¾d. to 4d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 3½d. to 4½d.
CRESYLIC ACID.—97/99%, 1s. 5d. to 1s. 8d.; 99/100%, 2s. to 2s. 6d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 1s 5d. to 1s. 6d.
NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. MANCHESTER: 90/160%, 1s. 5d. to 1s. 7d. per gal.
NAPHTHALENE.—Crude, whizzed or hot pressed, £5-£6 per ton; purified crystals, £9 10s. per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £10 10s. to £11 10s. 0d. per ton f.o.b.
PITCH.—Medium, soft, 26s. per ton, f.o.b. MANCHESTER: 24s. f.o.b., East Coast.
PYRIDINE.—90/140%, 12s. 6d. to 14s. per gal.; 90/160%, 10s. 6d. to 11s. 6d. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. MANCHESTER: 10s. 6d. to 14s. per gallon.
TOLUOL.—90%, 2s. 1d. to 2s. 2d. per gal.; pure 2s. 5d. to 2s. 6d. MANCHESTER: Pure, 2s. 5d. per gallon, naked.
XYLOL.—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. MANCHESTER: 2s. 4d. per gallon.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £6 15s. to £9 5s. per ton; grey, £8 to £8 5s. MANCHESTER: Brown, £8; grey, £9 10s.
METHYL ACETONE.—40.50%, £32 to £35 per ton.
WOOD CREOSOTE.—Unrefined, 6d. to 8d. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.— 2s. 8d. to 3s. per gal;. solvent, 3s. to 3s. 5d. per gal.
WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.
BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—2s. 1½d. to 2s. 5½d. per lb.
DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.
DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.
GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.
H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.
NAPHTHIONIC ACID.—1s. 10d. per lb.
β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.
α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.
β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.
o-NITRANILINE.—4s. 3½d. per lb.
m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8¾d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, July 26.—LINSEED OIL was steady. Spot, £26 per ton (small quantities); Aug., £23 10s.; Sept.-Dec., £22 17s. 6d.; Jan.-April, £22 12s. 6d., naked. SOYA BEAN OIL was slow. Oriental, July -Aug. shipment, c.i.f., bulk, £17 10s. per ton. RAPE OIL was neglected. Crude extracted, £31 10s. per ton; technical refined £32 15s., naked, ex wharf. COTTON OIL was easier. Egyptian crude, £17 5s. per ton; refined common edible, £20 5s.; deodorised, £22 5s., naked, ex mill (small lots £1 10s. extra). TURPENTINE was quiet. American, spot, 33s. per cwt.; Aug. delivery, 32s. 9d.

HULL.—LINSEED OIL, spot, £24 5s. per ton; July, £23 15s.; Aug., £23 7s. 6d.; Sept.-Dec., £22 15s. COTTON OIL. Egyptian, crude, spot, £16 5s.; edible refined, £19 5s.; technical, spot, £19 5s.; deodorised, £21 5s., naked. PALM KERNEL OIL, crude, f.m.q., spot, £17, naked. GROUND NUT OIL, extracted, spot, £22 10s.; deodorised, £25 10s RAPE OIL, extracted, spot, £30 10s.; refined, £31 10s. per ton. SOYA OIL, extracted, spot, £25 10s.; deodorised, £28 10s. per ton. COD OIL, f.o.r. or f.a.s., 25s. per cwt., in barrels. CASTOR OIL, pharmaceutical, 29s.; first, 34s.; second, 32s. TURPENTINE, spot, 34s. 3d. per cwt.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

GEO. FREELAND AND SONS, LTD., Tonbridge, manufacturers of fertilisers. (M., 29/7/39.) July 14, mortgage to National Provincial Bank, Ltd., securing all moneys due or to become due to the Bank; charged on Quarry Lodge and offices, Woodside Road, Tonbridge, etc.

RUGBY PORTLAND CEMENT CO., LTD. (M., 29/7/39.) July 12, £450,000 debenture stock and premium of 5 per cent. payable in certain events (inclusive of £400,000 already registered) secured by Trust Deed dated June 29, 1939, supplemental to Trust Deeds dated December 7, 1937, and October 21, 1938; general charge. *£400,000. May 4, 1939.

County Court Judgments

ANGLO-SCOTTISH CHEMICAL CO. (sued as a firm), 18 Great Horton Road, Bradford, chemical manufacturers. (C.C., 29/7/39.) £18 10s. 2d. June 13.

Declaration of Solvency Filed

LORIVAL MANUFACTURING CO. (1921), LTD., Little Lever, chemical manufacturers. (D.S.F., 29/7/39.) July 13.

Books Received

Organic Chemistry. By Paul Karrer, trans. by A. J. Mee. Amsterdam: "Elsevier." Pp. 902. 45s.

Luminescence. A General Discussion held by the Faraday Society. London: Gurney & Jackson. Pp. 240. 12s. 6d.

Boiler Feed Water Treatment. By F. J. Matthews. 2nd edit. London: Hutchinson's Scientific & Technical Publications. Pp. 319. 12s. 6d.

Company News

Blythe Colour Works, Ltd., has announced an interim dividend of 5 per cent., less tax (same).

Beechams Pills, Ltd., has formed a new subsidiary—Beecham Export Corporation, Ltd.—with a nominal capital of £15,000 in £1 ordinary shares.

The South Metropolitan Gas Co. is paying an interim dividend of 2½ per cent. on the ordinary stock for the six months ended June 30.

Monsanto Chemicals, Ltd., is paying an interim dividend of 10 per cent., tax free, for the year to December 31 next. For the previous year an interim of 16⅔ per cent. was followed by a final of like amount, making 33⅓ per cent.

British Burmah Petroleum Co., Ltd.—At the extraordinary general meeting of the company held on Monday, resolutions reducing the capital from £1,500,000 in shares of 8s. each to £750,000 in shares of 4s. each, and thereafter restoring the capital to its former amount by the creation of 3,750,000 shares of 4s. each, were duly carried.

Benn Brothers, Ltd.—The directors recommend the payment of the following final dividends, less tax, for the year ended June 30, 1939: 3 per cent. on preference shares, which with the interim dividend of 3 per cent. paid in February makes 6 per cent. for the year (same); 10 per cent. on ordinary shares, which with the interim dividend of 5 per cent. paid in February makes 15 per cent. for the year (same); 2s. per share on the deferred shares, which with the interim dividend of 1s. per share paid in February makes 3s. for the year (same).

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Switzerland.—A firm of agents established at Zurich wishes to obtain the representation, on a commission or buying on own account basis (w/goods in consignment), of United Kingdom manufacturers of printers' colours for Switzerland. (Ref. No. 607.)

South Africa.—H.M. Trade Commissioner at Johannesburg reports that the Pretoria Hospital is calling for tenders for the supply and delivery of quantities of drugs and medical sundries required for the calendar year 1940.

Tenders, endorsed "Tenders for Drugs," should be addressed to the Pretoria Hospital, Pretoria, where they will be received up to 12 noon on Friday, September 8, 1939. (T. 25242/39.)

Chemical and Allied Stocks and Shares

ENCOURAGED by more hopeful views as to international affairs and favourable reports from trade centres, the industrial section of the Stock Exchange has been slightly more active this week, and share values subsequently tended to move in favour of holders.

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Imperial Chemical were 28s. 9d. compared with 28s. 6d. a week ago, and the company's preference units were also little changed at 28s. 7½d. British Aluminium were more active and improved to 56s. 9d., aided by market expectations that the interim dividend will be maintained. British Oxygen were better at 79s. 4½d. and Murex and Turner & Newall improved, the last-named being 79s. 6d. Lever & Unilever showed only moderate movements and were unchanged on balance at 34s. Reckitt & Sons' ordinary were active and were well maintained at 100s. Fison, Packard & Prentice continued to attract a fair amount of attention on hopes that a larger dividend may be in prospect, and at 41s. 6d. were slightly above the price ruling a week ago. British Oil & Cake Mills' preferred ordinary were better at 39s. 9d., while British Match were again 34s. and Swedish Match 24s. 3d. B. Laporte were unchanged at 58s. Borax Consolidated deferred had a steadier appearance, and at 20s. 6d. have held virtually all the improvement shown a week ago.

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A good deal of attention continued to be given to Courtaulds, which have improved further from 28s. 1½d. to 30s. British Celanese ordinary and preference shares were also better, as were various other rayon shares, sentiment being influenced by reports of improving conditions in the rayon trade. Apart from a small rise in Lancashire Cotton Corporation to 11s. 4½d., other textile shares were dull and inactive.

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Stewarts & Lloyds at 43s. and Stanton Ironworks at 53s. were firm, having remained under the merger proposals, while Staveley Coal & Iron were 40s. 6d., aided by the more hopeful dividend estimates which remain current in the market. Talk of a possible increase in the distribution drew some attention to Dorman Long, which had a steadier appearance at 28s. 9d., while Guest Keen were better at 24s. 9d. Neepsend Steel & Tool were higher at 80s. 6d. on the increased payment for the year. The market is talking of the possibility that the £1 shares of the latter company may be "split" into shares of 5s. denomination. Babcock & Wilcox were higher at 45s. 9d. and Hopkinsons improved. A better price was also made by Pressed Steel ordinary units.

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Pinchin Johnson at 22s. were virtually the same as a week ago, while International Paint improved from 78s. 9d. to 79s. 4½d. Blythe Colour Works were steady at 7s. 6d., aided by the maintenance of the interim dividend. Awaiting news of the bonus proposals, British Plaster Board improved further from 29s. 4½d. to 30s., while Low Temperature Carbonisation 2s. units rallied from 1s. 4½d. to 1s. 10½d. British Glues were better at 5s. compared with 4s. 9d., and the company's participating preference shares, which received a dividend of 10 per cent. for the past year, changed hands at 24s. 9d. British Industrial Plastics were again 1s. 6d. Burt Boulton & Haywood were quoted at 17s. 6d. Monsanto Chemicals 5½ per cent. preference were unchanged at 21s. 10½d.

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Metal Box were firm following the news of the acquisition of another business, and as compared with a week ago, the price has improved from 71s. 3d. to 72s. 6d. General Refractories were little changed at 7s. 3d. Wall Paper deferred kept at 25s., while Michael Nairn were again 53s. 1½d. and Barry & Staines changed hands around 31s. 6d. Associated Cement improved from 67s. 6d. to 68s. 9d. Triplex Glass, which continued under the hope that the dividend may be maintained at 25 per cent., were 38s., or 6d. higher than a week ago. United Molasses were well maintained at 24s. 4½d., while Distillers were favoured on the statements at the meeting, and moved up from 94s. 6d. to 95s. 9d.

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Boots Drug were higher at 41s. 6d. compared with 40s. 6d., while Sangers at 20s. 6d., British Drug Houses at 21s. 3d. and Timothy Whites at 22s. 4½d. were well maintained. Among oil shares rather better prices ruled for "Shell" and Anglo-Iranian.